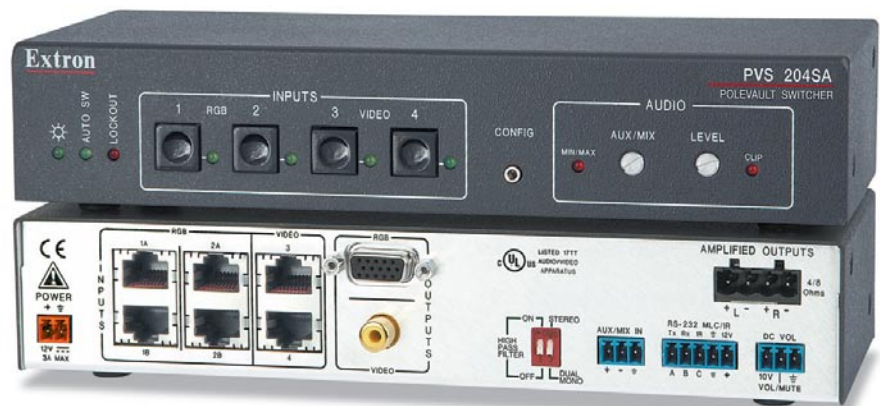


## User's Manual





# PVS 204SA

PoleVault™ Switcher

# Precautions

## Safety Instructions • English

- 


This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.
- 


This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

### Caution

- Read Instructions** • Read and understand all safety and operating instructions before using the equipment.
- Retain Instructions** • The safety instructions should be kept for future reference.
- Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.
- Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Consignes de Sécurité • Français

- 


Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).
- 


Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

### Attention

- Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.
- Conservser les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.
- Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.
- Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Sicherheitsanleitungen • Deutsch

- 


Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.
- 


Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

### Achtung

- Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.
- Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.
- Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.
- Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Instrucciones de seguridad • Español

- 


Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.
- 


Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

### Precaucion

- Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.
- Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.
- Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.
- Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

## 安全须知 • 中文

- 

这个符号提示用户该设备用户手册中有重要的操作和维护说明。
- 

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

### 注意

- 阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。
- 保存说明书** • 用户应保存安全说明书以备将来使用。
- 遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。
- 避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

### Warning

- Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.
- Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).
- Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.
- Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.
- Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.
- Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

### Avertissement

- Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.
- Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.
- Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.
- Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.
- Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.
- Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un ype équivalent recommandé par le constructeur. Mettre au reut les batteries usagées conformément aux instructions du fabricant.

### Vorsicht

- Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.
- Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.
- Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.
- Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.
- Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.
- Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

### Advertencia

- Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.
- Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.
- Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.
- Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.
- Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.
- Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

### 警告

- 电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。
- 拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。
- 电源线保护** • 妥善布线，避免被踩踏，或重物挤压。
- 维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。
- 通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。
- 锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

# Quick Start — PVS 204SA

## FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

**NOTE** This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

## Installation

This Quick Start section deals specifically with quick connectivity and installation of the PVS 204SA PoleVault™ switcher. At this stage, it is assumed that all of the necessary cable routing has been completed, and that projector ceiling hardware (e.g. ceiling mounts, projector poles, projector mounting kits) and output devices have been installed. Also, any PVT transmitters should already be installed (but not yet connected) following the relevant supplied instruction manuals.

### Step 1

Remove power from the switcher and any input, output, and control devices that are to be used in this installation.

### Step 2

Using the supplied colored labels, label both ends of all audio/video input cables. Ensure that the labels used match the input signal type that the cable will carry. See chapter 2, "Installation", "Labeling and connecting the A/V input cables" section, for wiring diagrams and input color coding table.

**NOTE** In some installations it may be prudent to label the cables before routing them.

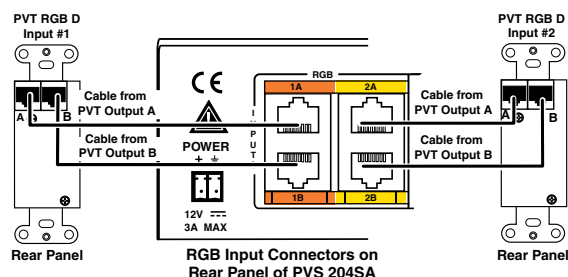
### Step 3

Connect input devices via PVT transmitters to the RJ-45 inputs on the rear of the PVS switcher. See chapter 2, "Installation", "A/V input connections" section, for details and wiring diagrams.

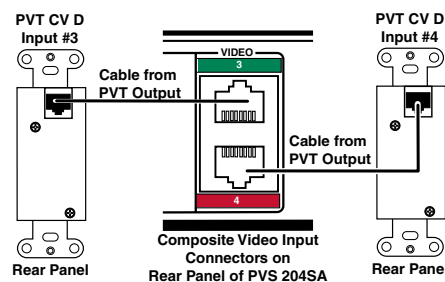
**NOTE** Labeling the cables correctly using the color code will make this step easier.

**Inputs 1 and 2:** RGB video and audio.

**NOTE** Two cables (A and B) are needed for each RGB input. Do not cross connect them.



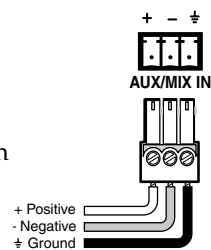
**Inputs 3 and 4:** Composite video and audio.



### Step 4 (optional)

Connect a mono audio source to the Aux/Mix audio input on the rear panel to mix a line-level audio signal with the selected input's audio.

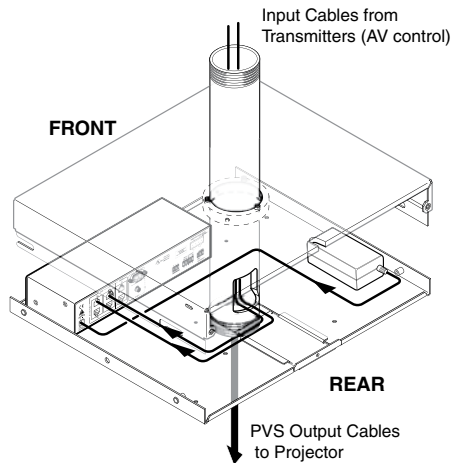
**NOTE** This channel is always active.



## Quick Start — PVS 204SA, cont'd

### Step 5

Connect cables from the switcher's RGB and composite video output connectors to the inputs on the display device (e.g., projector).

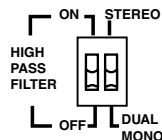


### Step 6

Connect the speakers to the amplified outputs port on the rear of the switcher. See chapter 2, "Installation", "Speaker Configuration" section, for details.

### Step 7

Set the rear panel DIP switch according to audio output mode (up for stereo or down for dual mono). See chapter 2, "Installation", "A/V output connections" section, for details.



### Step 8

Connect a host computer, a control system, or an MLC (MediaLink™) controller to the RS-232/MLC/IR control port on the rear panel. See chapter 2, "Installation", "Control connection" section, for details.

Alternatively, connect an IR Link signal repeater to this port for control using an IR remote.

### Step 9

Secure and cable the switcher in the PMK 450. See chapter 2, "Installation", "Mounting the Switcher" section, for details.

### Step 10

Restore power to all devices.

### Step 11

Set up and optimize the audio (gain control and input sensitivity) for each input, including Aux/Mix. This can be done via the front panel or by RS-232 control. See chapter 3, "Operation and Setup", "Setting Up and Optimizing the Audio" section, for details.

**NOTE** Upon initial power up of the switcher, the amp level is automatically adjusted to 50%.

### Step 12

Fine tune the audio by bass, treble, and loudness adjustment. See chapter 3, "Operation and Setup", "Setting Up and Optimizing the Audio", "Bass, treble, and loudness control" sections, for details.

**NOTE** Do not control the PVS volume via RS-232 if the DC volume port is connected to a VCM 100. If an VCM is controlling the volume, an MLC should not be connected to the MLC/IR/RS-232 port. See chapter 2, "Installation", "Control connection" section, for details.

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**Rev. D**  
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**PVS 240SA**

# 1

# Chapter One

## Introduction

About this Manual

About the PVS 240SA

Application Diagrams

# Introduction

---

## About this Manual

This manual covers the installation, operation, and configuration of the Extron PVS 204SA PoleVault™ Switcher. Throughout the manual, this switcher is interchangeably referred to as the PVS 204SA, PVS switcher, PoleVault switcher, PVS, and switcher.

## About the PVS 204SA

The Extron PVS 204SA is a four input, two output, twisted pair, audio and video switcher with a built in audio amplifier. This switcher is comprised of two independent, built in switchers (a 2 x 1 RGB video and audio switcher and a 2x1 composite video and audio switcher), that allows the PVS 204SA to accept high resolution (RGB) video and audio, and composite video and audio signal inputs, along with a line level mono audio auxiliary/mix input. The PVS 204SA is part of the PoleVault System, a cost effective system with easy cable installation for transmission of video and audio signals, that is used in conjunction with the Extron PVT series of transmitters and Extron speakers.

The PVS 204SA can be easily installed at ceiling level using the Extron Pole Mount Kit (PMK 450) as part of the Extron PoleVault system.

The PVS switcher receives the video and audio signals sent from PVT transmitters, which can be located up to 100' (30 m) away. The signals can be sent over Extron Enhanced Skew-Free™ A/V UTP cable, or any CAT 5, 5e, or 6 shielded twisted pair (STP), unshielded twisted pair (UTP), or foil shielded twisted pair (FTP) cable.

The PVS switcher can be controlled from either the front panel buttons, an RS-232 control, an IR remote, or a MediaLink controller.

The PVS 204SA's built-in 2-channel power amplifier outputs up to 13 W on 4 ohm load per channel or 7 W with 8 ohm loads as stereo or dual mono audio. Volume control is made via the front panel, RS-232, IR, or an Extron VCM control.

Various front panel controls allow the user to adjust the Aux/Mix volume (independent from input gains, power amplifier gain, and volume) and global control of the power amp level adjustments.

RS-232 control allows the user to adjust the individual channel gain, limiter on/off settings, loudness on/off settings, and bass and treble adjustments.

A dual DIP switch allows the user to switch between stereo and dual mono mode outputs, and to switch the high pass filter on or off.

## TP cable advantages

Twisted pair cable is smaller, lighter, more flexible, and less expensive than coaxial cable. Termination of TP cable with RJ-45 connectors is simple, quick, and economical. See chapter 2, "Installation", "A/V input connections" section, for wiring details.

**NOTE** For PVT transmitter installation and connection, consult the user's manual supplied with the transmitters.



---

## Features

**Twisted pair inputs** — The switcher accepts two independent, high resolution RGB video and audio signals and two composite video and audio signals, transmitted on twisted pair cable from a source up to 100' (30 m) away.

**Video output** — The PVS switcher can switch between four inputs (two RGB and two composite).

**Aux/Mix input** — The PVS switcher can mix a mono line level audio input with the audio input from the video/audio source.

**Amplified Audio output** — The switcher allows user selectable stereo or dual mono, 4 or 8 ohm audio outputs through the integrated audio amplifier.

**Executive Mode** — To prevent unauthorized access the switcher panel can be locked (executive mode) via the front panel or RS-232. An LED on the front panel indicates executive mode status.

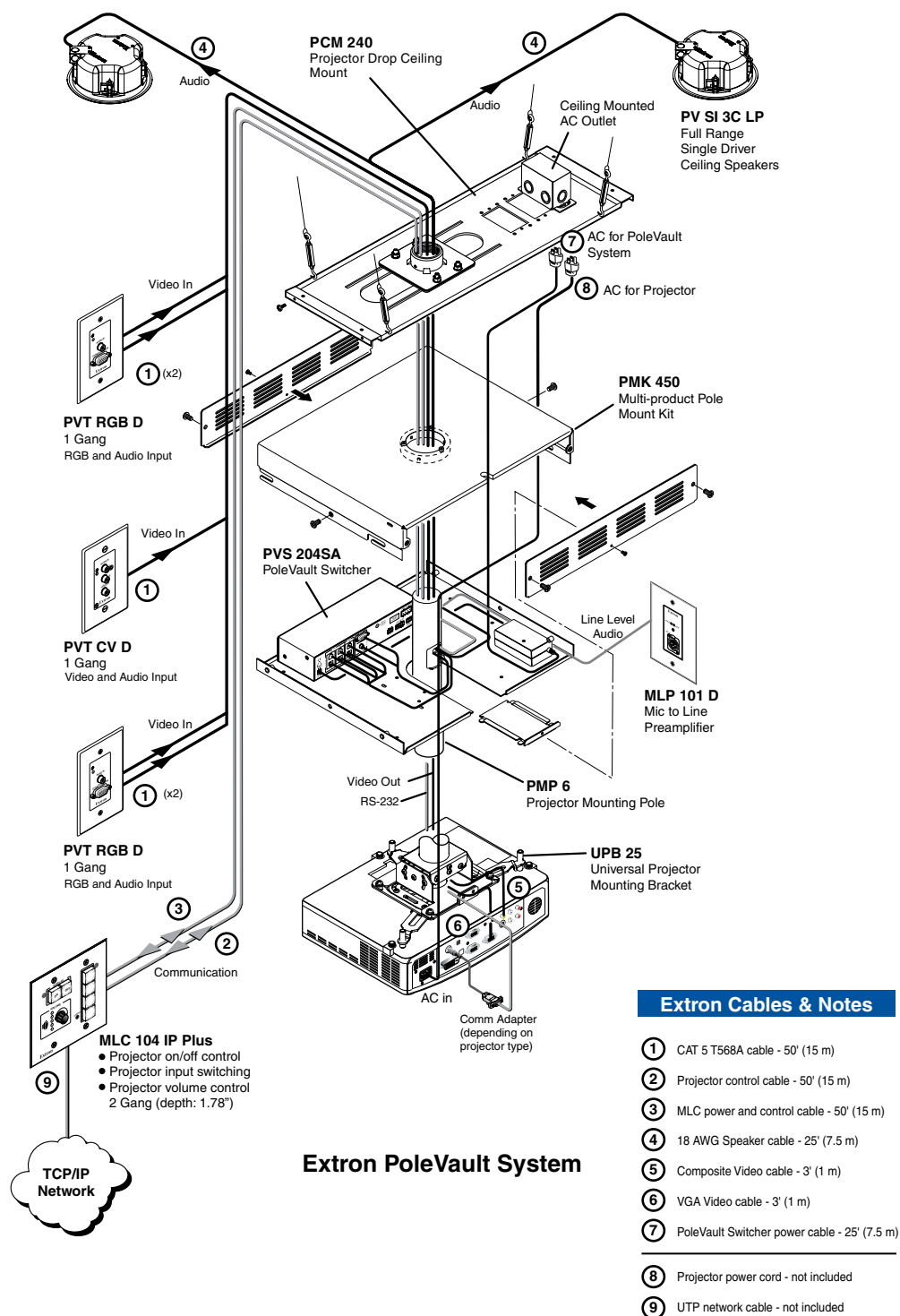
**Control and configuration** — Firmware updates to the switcher can be made via a front panel config port. The switcher can also be configured via RS-232 and controlled via the front panel, RS-232, or wired IR.

Other features include:

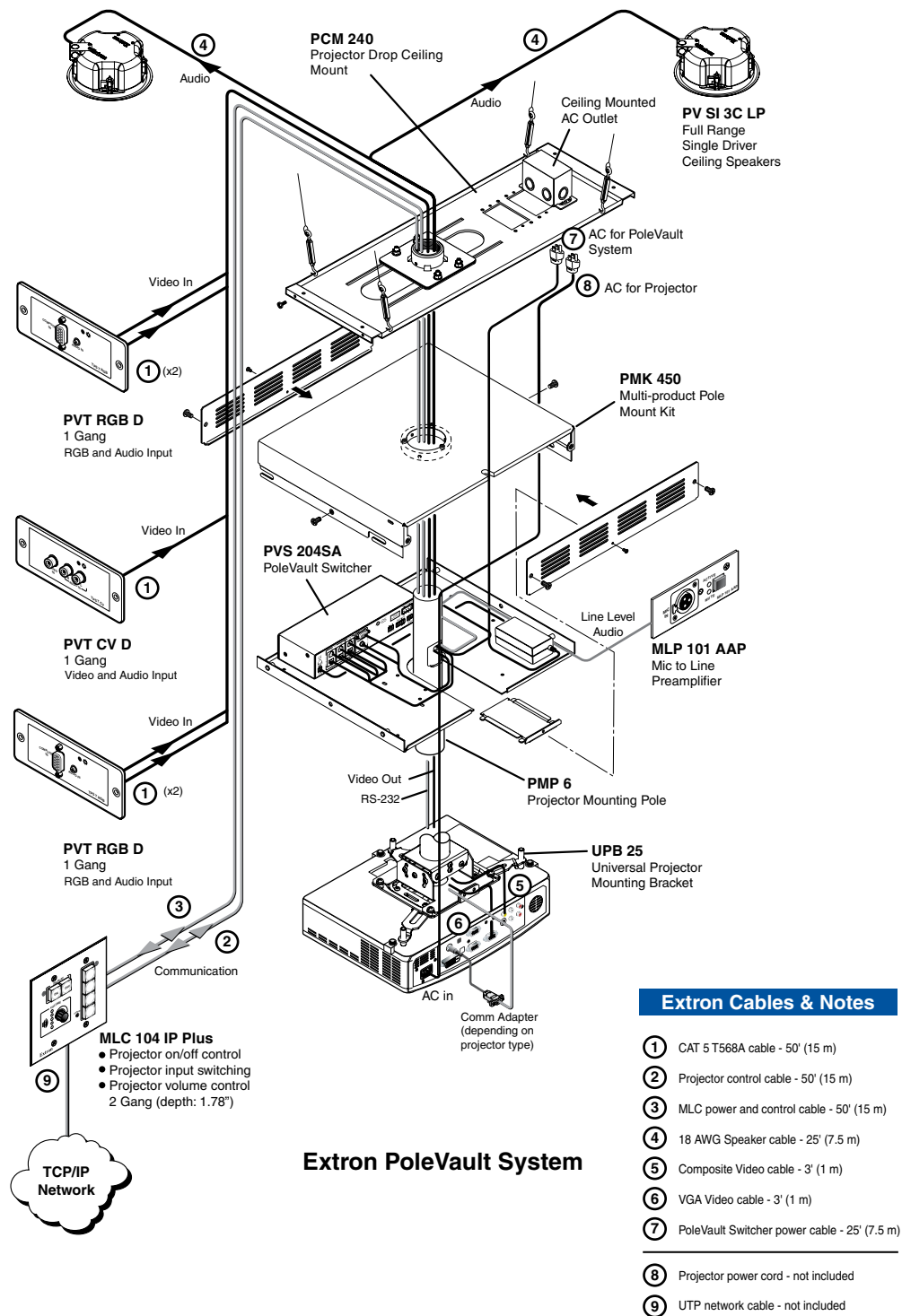
- Amplifier indication LED
- User selectable switching of input and status indication LED
- User selectable “single” or “separate” switcher modes
- Rear panel mounted captive screw connector for RS-232, MLC, or IR control
- Rear panel mounted captive screw connector for external volume control

# Introduction, cont'd

## Application Diagrams



**Figure 1-1 — Example of a typical application of the PVS 204SA and the PoleVault™ videolaudio system with Decora® model PVT transmitters**



**Figure 1-2 — Example of a typical application of the PVS 204SA and the PoleVault video/audio system with AAP model PVT transmitters**

## **Introduction, cont'd**

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**PVS 240SA**

# 2

## **Chapter Two**

### **Installation**

UL/Safety Guidelines

Mounting the Switcher

Rear Panel Features and Cabling

Speaker Configuration

Labeling the A/V Inputs

Final Setup

# Installation

---

## UL/Safety Guidelines

The Underwriters Laboratories (UL) guidelines listed below pertain to the safe installation and operation of this switcher.

### Important safety instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

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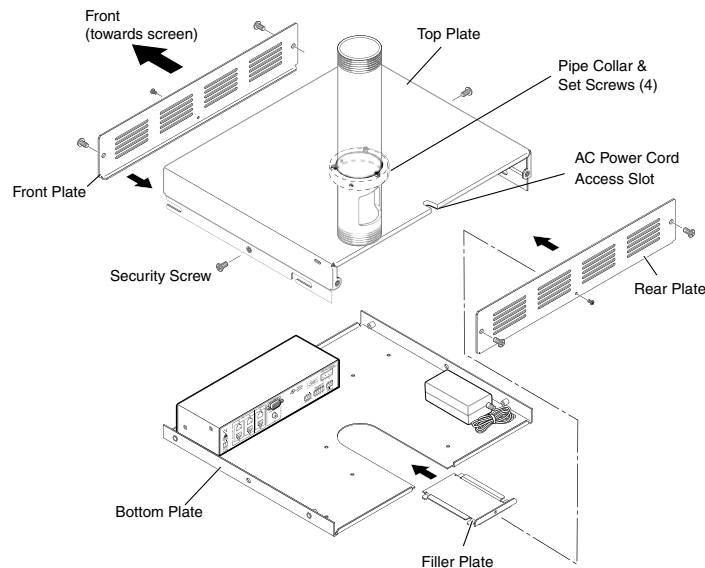
## Mounting the Switcher

The PVS 204SA can be mounted on the Extron PMK 450 (Pole Mount Kit), which should be installed above the projector. The low profile of the PVS switcher and the PMK 450 allows them to be installed in tight spaces. To install the PVS 204SA on the PMK, follow the steps shown in the instruction guide supplied with the PMK 450. If the PMK 450 is already installed, do the following:

1. Remove the front, rear, and filler plates and separate the top and bottom plates of the PMK (see figure 2-1).

**NOTE** Do not install the rubber feet on the PVS 204SA when installing the device in a PMK 450.

2. Placing the PVS 204SA on the PMK, align the two diagonally opposite securing holes (located in the base of the switcher) over two suitable holes in the floor of the PMK.

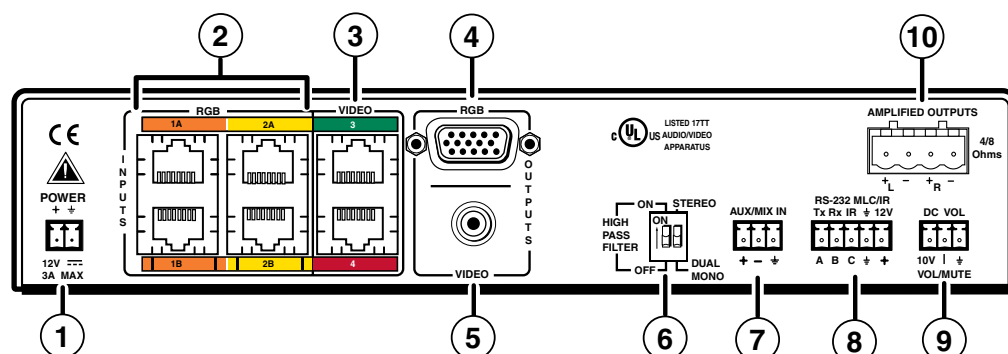


**Figure 2-1 — Installing the PVS 204SA on the PMK 450**

3. Pass two 4-40 x 3/16" screws up through the floor of the PMK into the holes in the base of the switcher, and secure it in place using an Extron Tweaker or a Phillips #1 screwdriver.
4. Install the power supply on the right rear of the PMK 450 bottom plate and secure it using Velcro®.
5. Install any other desired devices on the PMK 450, following the installation steps in the devices' user manuals.
6. Lift up the plate (with the devices installed) to the pole, and connect the twisted pair, audio, control, and power cables (see "Rear Panel Features and Cabling", in this chapter, for details).
7. With all the cables connected, slide the lugs on the bottom plate into the notches on the top plate and secure with screws.
8. Replace the front, rear, and filler plates.
9. If installing the full PoleVault™ system, continue installing the rest of the hardware, devices and cabling, referring where applicable to the instructions in the relevant user manuals. See pages 1-4 and 1-5 in chapter 1, "Introduction," for examples of PoleVault™ System applications.

# Installation

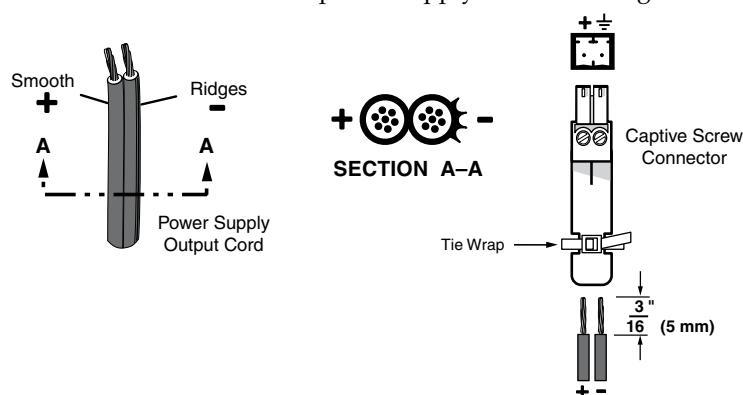
## Rear Panel Features and Cabling



**Figure 2-2 — Features of the PVS 204SA Switcher rear panel**

### Power connection

- ① **DC power connector** — Attach the supplied male captive screw connector to the cord of the included power supply as shown in figure 2-3.



**Figure 2-3 — Wiring the orange captive screw power connector**

When all other cables have been connected, plug the captive screw connector into the 2-pole female connector (①) to connect the switcher to the 12 VDC power source. The front panel power LED (☼) lights while the PVS is receiving power.

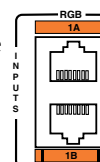
**NOTE** Use only the supplied 12 V power supply for this switcher.

### A/V input connections

- ② **RGB video and audio inputs ("RGB")** — Each RGB input requires the use of two twisted pair cables. Using the TP cables, connect one or two high resolution computer video and audio sources via PVT transmitters to these four RJ-45 female connectors.

**CAUTION** The PoleVault signal transmission method is specific for PVS 204SA switchers working with PVT transmitters. **DO NOT** connect to an MTP system. **DO NOT** connect to an Ethernet/LAN or data transmission system.

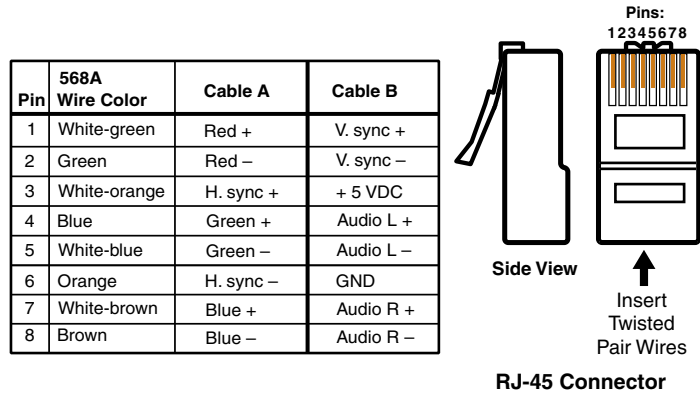
**NOTE** The PVS 204SA can receive signals from PVT transmitters located up to 100 feet (30 m) away. **The optimum distance is between 50 (15 m) and 75 feet (23 m).** The minimum distance is 15 feet (5 m).





**NOTE** RJ-45 termination must comply with the TIA/EIA T 568A or 568B wiring standards for all connectors. The same standard **MUST** be used at both ends of all cables.

**NOTE** The RGB cables supplied with the PoleVault system are terminated to the TIA 568A standard, as shown in figure 2-4.

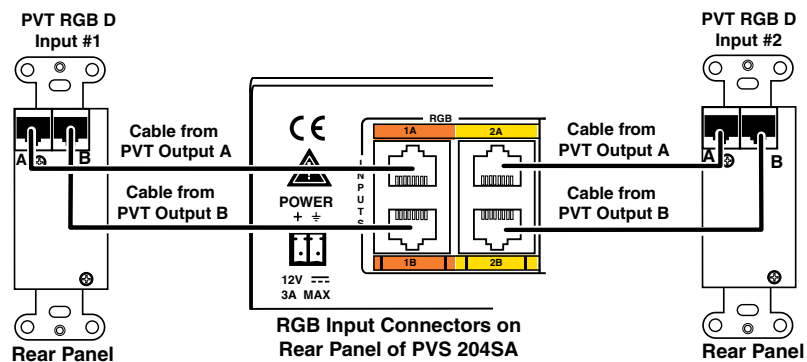


**Figure 2-4 — Twisted pair RGB video and audio cable wiring.**

**NOTE** Cable A Video carries the video signals and horizontal sync, and cable B carries the audio signal, vertical sync information, and 5 VDC current from the PVS to power the PVT transmitters.

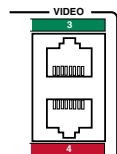
**NOTE** The ports on the rear of the PVS 204SA are color coded for input number and signal type. To ensure correct cable identification and connection during installation, a sheet of color coded cable labels is supplied. See “Labeling the A/V Inputs”, later in this chapter, for details on how to use these labels.

**NOTE** When connecting the TP cables to the PVS 204SA, take care not to cross-connect the cables; connect input 1’s video signal to the RJ-45 port labeled 1A, and input 1’s audio signal to the RJ-45 port labeled 1B. Likewise, connect input 2’s video signal to 2A, and the audio signal to 2B (see figure 2-5).



**Figure 2-5 — Connect the correct transmitter output cables to the switcher inputs.**

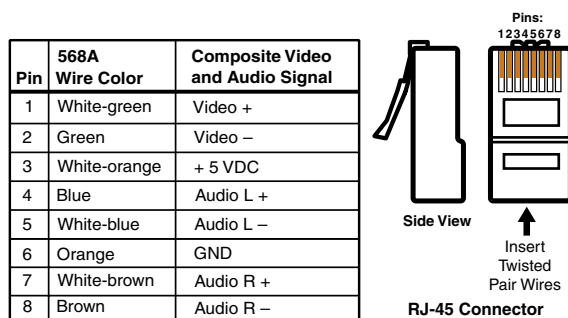
- ③ **Composite video and audio inputs (“Video”)** — Each composite video input needs one TP cable. Using TP cable, connect up to two composite video and audio sources via PVT transmitters to these two RJ-45 female connectors labeled 3 and 4; each one is for video and audio combined.



## Installation, cont'd

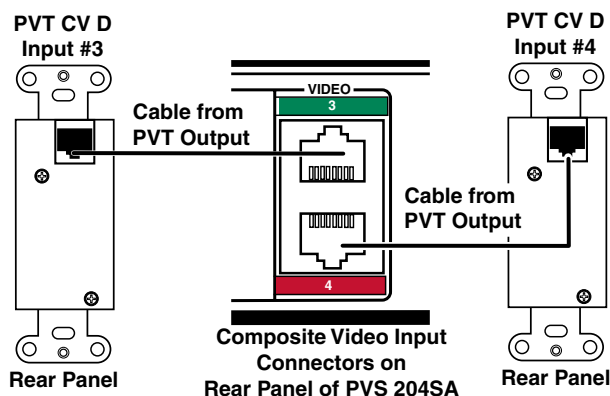
**NOTE** RJ-45 termination must comply with the TIA/EIA T 568A or 568B wiring standards for all connectors. The same standard **MUST** be used at both ends of all cables.

**NOTE** The composite video cables supplied with the PoleVault system are terminated to the TIA 568A standard, as shown in figure 2-6.



**Figure 2-6 — Twisted pair composite video and audio cable wiring.**

**NOTE** When connecting the TP cables to the PVS 204SA, take care to connect input 3's cable to the RJ-45 port labeled 3, and input 4's cable to the RJ-45 port labeled 4 (see figure 2-7).

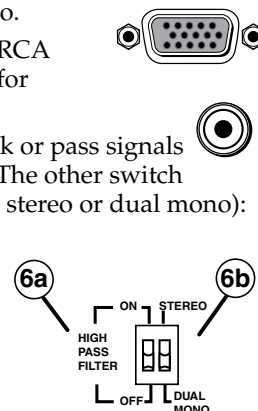


**Figure 2-7 — Connect the correct transmitter output cables to the switcher inputs.**

### A/V output connections

- ④ **RGB video output** — Connect a VGA cable to this female 15-pin HD connector and to the projector for RGB video.
- ⑤ **Composite (video) output** — Connect a cable with an RCA connector to this female RCA jack and to the projector for composite video.
- ⑥ **DIP switch** — One switch (6a) allows the user to block or pass signals under 100 Hz to the amplifier using a high pass filter. The other switch (6b) allows selection of the audio output mode (either stereo or dual mono):
  - 6a **High Pass Filter control** — To turn the high pass filter to on or off, set the switch to the desired position. **Default setting is off.**

**NOTE** Setting the DIP switch to on prevents signals less than 100 Hz entering the amplifier, whereas setting it to off allows those signals to pass to the amplifier.

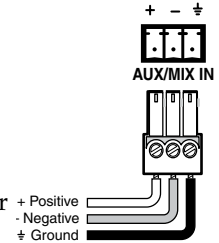


- ⑥b) **Stereo and Dual Mono selection** — To select stereo or dual mono audio output, set the switch to the desired position. Dual mono sums left and right audio signals together and outputs the same signals on both audio output channels. **Default setting is mono.**

**NOTE** For best results when speech is the primary audio, set this switch for dual mono with the high pass filter set to on. If music is involved, set the switch to stereo with the high pass filter set to off.

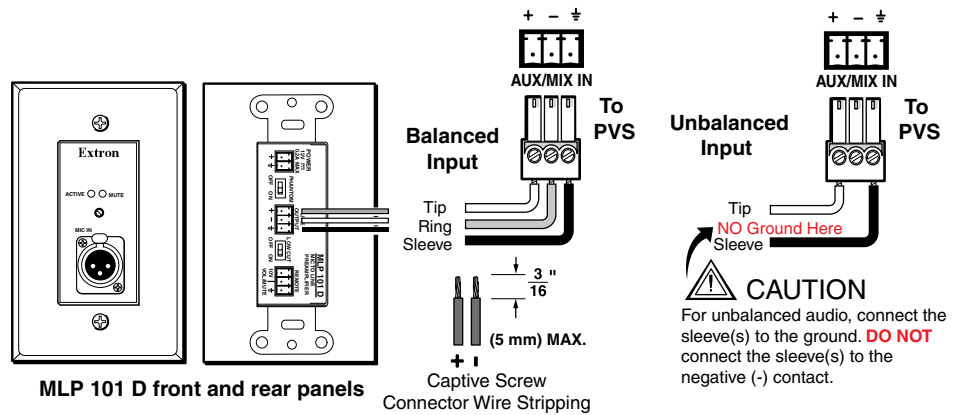
## Aux/Mix input connection

- ⑦ **Aux/Mix audio input** — To mix an auxiliary, mono, line-level audio signal (from a wireless microphone receiver, for example) with the selected input's audio, connect the cable from the mono source to this 3-pole captive screw connector. The signal can be balanced or unbalanced. Wire the supplied blue 3-pole male captive screw connector as shown at right.



**NOTE** This audio input signal is present regardless of the selected input on the switcher. The audio level is not affected by the program volume.

For wired microphones, connect an Extron MLP 101 microphone-to-line preamplifier to the Aux/Mix port on the PVS 204SA, to convert the microphone output to line level. Follow the installation instructions in the user manual supplied with the MLP 101 to connect the microphone. See figure 2-8 to wire the MLP to the switcher.

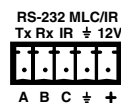


**Figure 2-8 — Wiring an MLP 101 D to the PVS 204SA Aux/Mix connector**

## Installation, cont'd

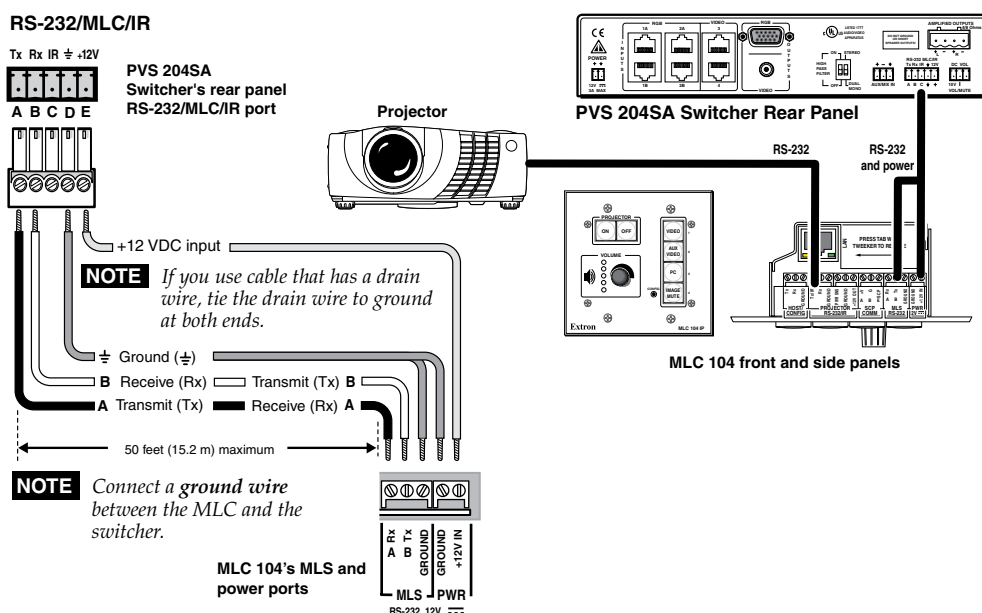
### Control connection

- ⑧ **RS-232/MLC/IR control port** — The PVS switcher can be controlled via an RS-232 connection directly from a host computer, a control system, or a MediaLink Controller (MLC). For IR remote control, connect an Extron IR Link to this port. RS-232 connection can be used to configure the PVS switcher. Connect a cable between this port and an optional Extron MediaLink Controller or an optional IR Link IR signal repeater.



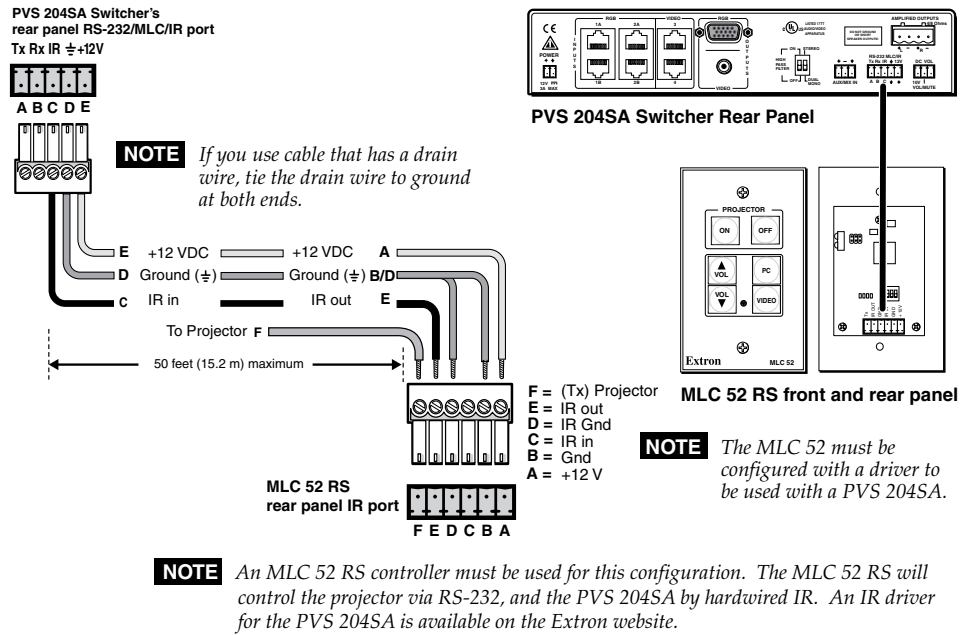
- The MLC provides remote control of input switching and volume.
- The IR Link accepts modulated IR signals from a remote control (e.g. the Extron IR 452 remote) enabling the remote control to be used for selecting the switcher inputs.

Wire the captive screw connector and connect it to a computer or control system, an MLC, or an IR Link, as shown in figures 2-9 through 2-12.



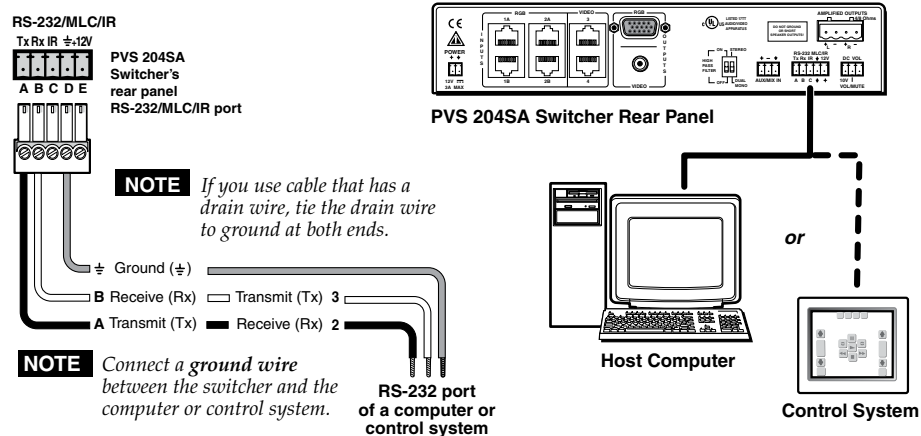
**Figure 2-9 — Connecting an MLC 104 to the switcher**

- NOTE** The PVS 204SA power supply can support a typical system, for example:
- a PVS 204SA
  - 4 PVT transmitters
  - 2 or 4 speakers (see "Speaker Configuration" later in this chapter for details)
  - an MLC 104 IP Plus with an IRCM DV+
  - an MLP 101 D
- If an SCP 104 is used in the system, the MLC 104 Plus **MUST** have its own power supply.
- The PVS 204SA provides sufficient power to run an MLC 104 IP or any MLC 52 RS model.



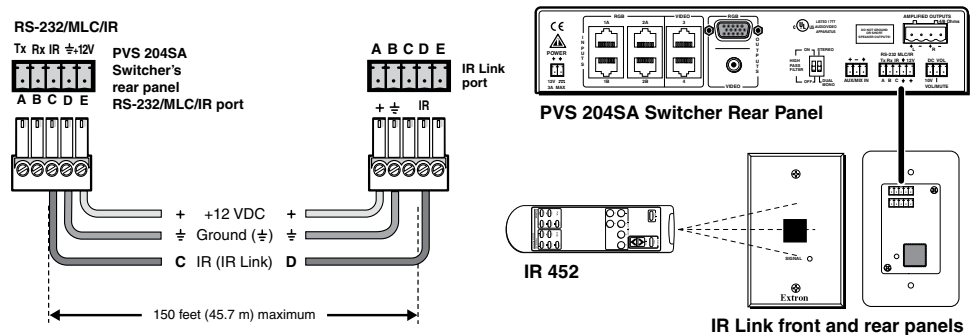
**Figure 2-10 — Connecting an MLC 52 RS series controller**

**NOTE** Connection of an MLC 52 VC follows the same setup as the MLC 52 (see figure 2-10), with the exception that speaker volume can be controlled with the rotary potentiometer on the front panel of the MLC 52 VC.



**Figure 2-11 — Connecting a computer or control system**

## Installation, cont'd

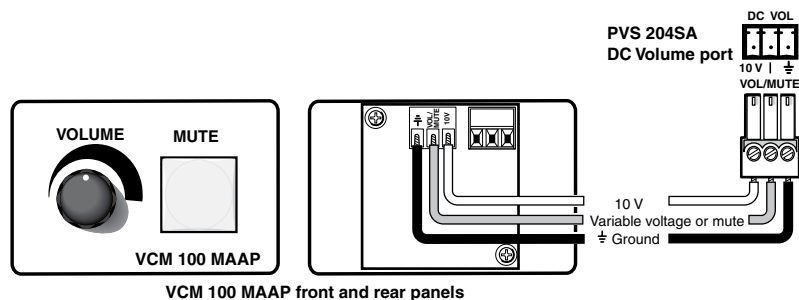


**Figure 2-12 — Connecting an IR Link to the switcher**

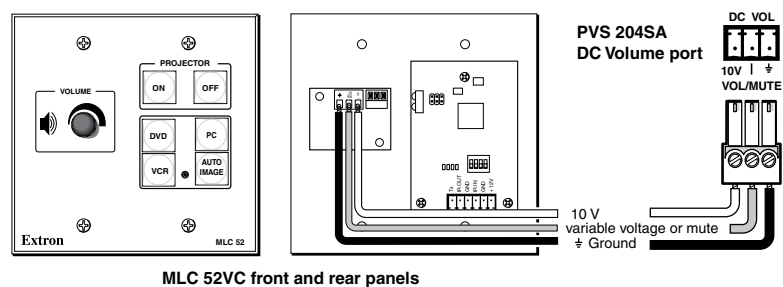
- ⑨ **DC Volume control port (Vol/Mute)** — This port connects an Extron external volume control module, such as a VCM, or the MLC 52 VC to the PVS 204SA. The range is 0 to 10 V, where 0 V is mute and 10 V is maximum volume. When connected, the external volume control module is the sole volume controller.

**NOTE** Do not control the PVS volume via RS-232 if this port is connected to a VCM 100, a VC 50, or an MLC 52 VC. If a VCM is controlling the volume, an MLC should not be connected to the MLC/IR/RS-232 port.

Connect the supplied, male, 3-pole captive screw connector to this port, wiring the connector as shown in figures 2-13 and 2-14.

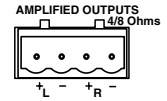


**Figure 2-13 — Wiring a VCM100 MAAP to the DC volume port**



**Figure 2-14 — Wiring an MLC 52 RS VC to the switcher's DC volume port**

- ⑩ **Amplified Out** — Wire and connect the supplied 4-pin 5 mm connector to this port, marked “L” and “R” (left and right) for 4 or 8 ohm speaker output.



**CAUTION** Do not tie both L and R outputs to each other and/or to ground. Doing so will short out the outputs and damage the amplifier.

**NOTE** The speaker setup covers two individual speakers of 8 ohm impedance or two pairs of speakers in parallel where each channel drives a maximum output load of 4 ohms

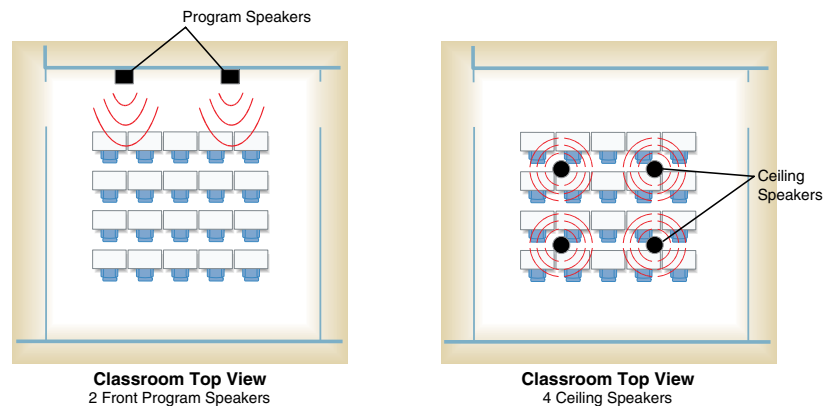
## Speaker Configuration

### Speaker arrangement examples

Ceiling and program speakers can be arranged several different ways. The following factors affect the choice of speaker placement:

- Dimensions of the room
- Room acoustics
- Desired evenness of sound coverage
- Audience mobility (whether the audience will be seated or not)
- Ambient noise level
- Type of music or other audio source

Some general ideas for speaker placement are included below.



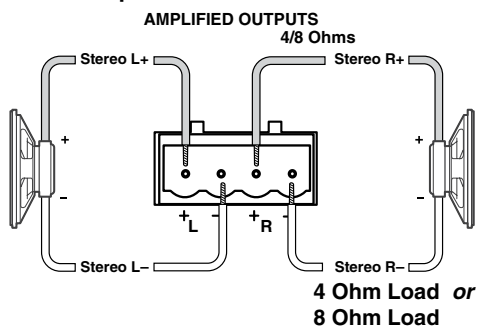
**Figure 2-15 — Examples of speaker layouts**

## Installation, cont'd

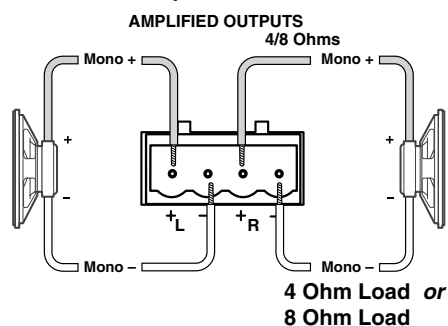
### Connecting speakers to the PVS 204SA

To obtain the correct impedance loading for your specific speaker system, follow the relevant setup as shown below.

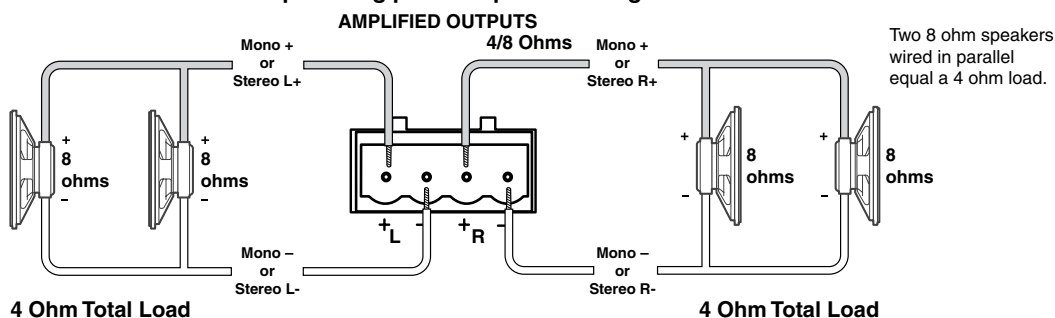
#### Stereo Output



#### Dual Mono Output



#### Stereo or Dual Mono Output using parallel speaker wiring



#### Stereo or Dual Mono Output using series speaker wiring

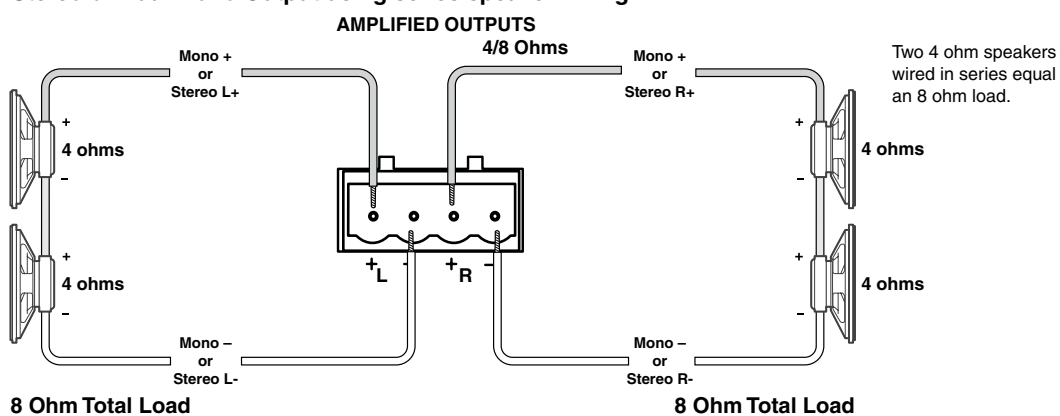


Figure 2-16 — Speaker impedance loading



## Labeling the A/V Inputs

### Labeling and connecting the A/V input cables

The RGB and composite video input ports on the rear of the PVS 204SA are color coded to aid easy identification of the input signal type. A sheet of corresponding colored labels is supplied for the installer to label the cables running from the PVT transmitters to the switcher. Once the labels are attached to the cables, the signal type transmitted on any cable can clearly be identified, enabling correct cable connection during installation.

To label the cables,

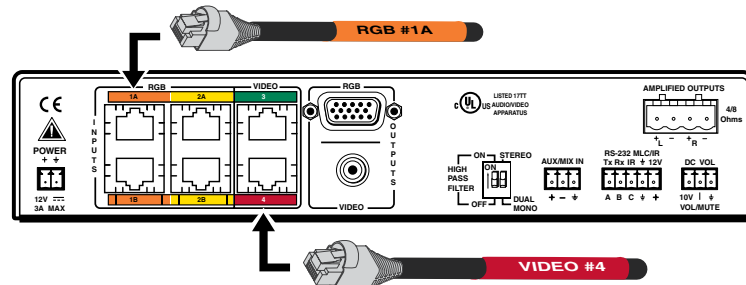
1. Peel off the label corresponding to the cable's signal type (see the table below) and affix it close to one end of the cable.

**NOTE** *Align and press the colored section of the label to the cable **first**, then wrap the clear section around the cable, allowing the signal type name to be easily read.*



**Figure 2-17 — Wrap the label around the cable, colored part first.**

2. Repeat step 1 for the other end of the cable, using the same label type.
3. Using the correct label type, repeat steps 1 and 2 as necessary for all signal cables that are to be connected to the PVS 204SA.
4. Connect the colored coded cable to the corresponding color coded port.



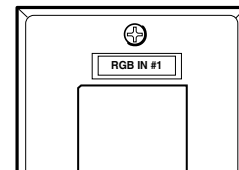
**Figure 2-18 — Connect the cables to the relevant input port.**

Cable Input Signal	Input Port #	Background Color	Text color
RGB (cable A)	1A	Orange	black
RGB (cable B)	1B	Orange w/stripe	black
RGB (cable A)	2A	Yellow	black
RGB (cable B)	2A	Yellow w/stripe	black
Video	3	Green	white
Video	4	Red	white

## Installation, cont'd

### Labeling the PVT Decora face plates

To help identify the input number and type of signal that any PVT Decora transmitter sends to the PVS switcher when the transmitter is installed, a series of small labels are supplied. A label identifying the transmitted signal type should be affixed to each Decora faceplate (top or bottom) where it can easily be seen after installation. This aids the user to connect a device corresponding to the plate transmission signal type, allowing correct input switching at the PVS 204SA.

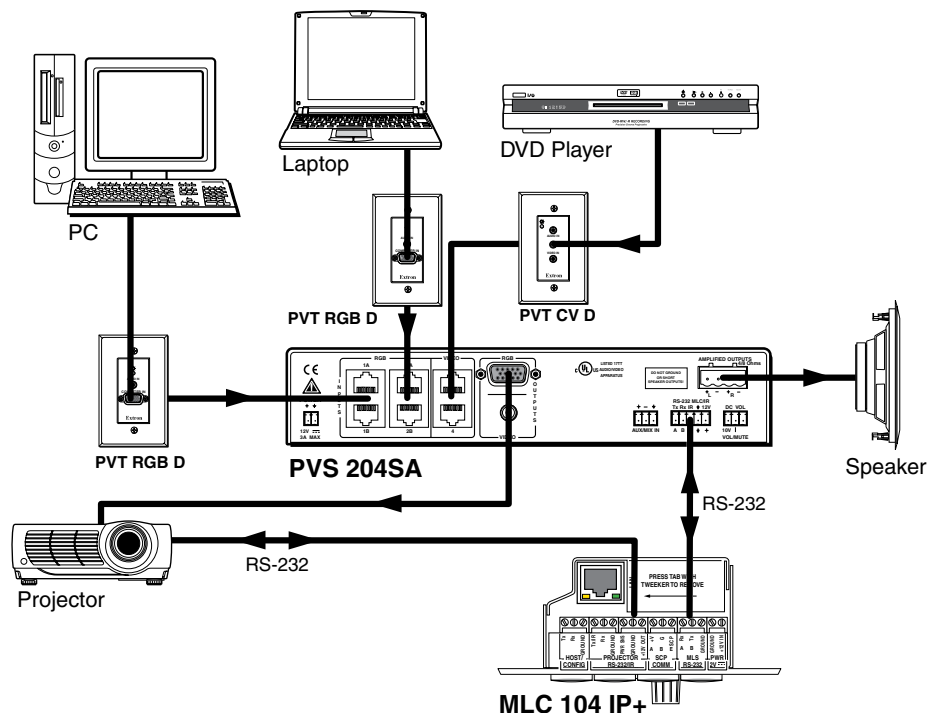


### Final Setup

With an MLC 104 IP Plus as a standard MLC controller in the PoleVault system package, your final PVS 204SA switcher setup should look similar to the figure below.

Ensure all connections are correctly made and secure.

**NOTE** Refer to the MLC device user's manual for full MLC installation, configuration, and operating details.



**Figure 2-19 — MLC 104 IP Plus controller and other typical devices connected to the PVS switcher.**



**PVS 240SA**

# 3

## **Chapter Three**

### **Operation and Setup**

Front Panel Features and Operation

Setting Switcher Modes

Auto Switching

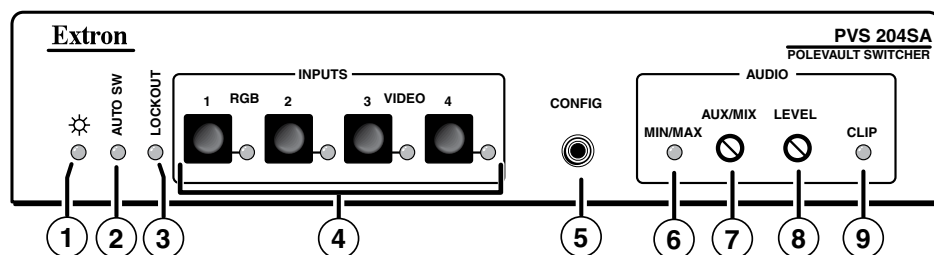
Setting Up and Optimizing the Audio

Resetting the Switcher

Front Panel Security Lockout (Executive Mode)

# Operation and Setup

## Front Panel Features and Operation



**Figure 3-1 — Front panel features**

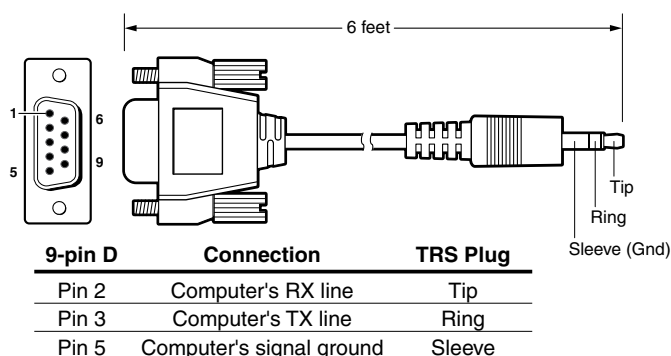
- ① **Power indicator LED** — When lit, this green LED indicates that the switcher has power supplied to it.
- ② **Auto switching indicator LED** — When lit, this green LED indicates that the auto switching is turned on. See page 3-4 for instructions on how to turn auto switching on and off.
- ③ **Lockout indicator LED** — This red LED indicates the lockout status (executive mode) of the front panel controls (on or off). See page 3-8 for details on how to lock and unlock the front panel.
- ④ **Input selection buttons and indicator LEDs** — Press one of these buttons to select the desired audio and video input. The corresponding green LED lights and remains lit while the input is selected. These buttons are also used to configure the switcher. See “Setting Switcher Modes”, later in this chapter.

**NOTE** *Input buttons 1 and 2 and their associated LEDs are for RGB video and audio input, and buttons 3 and 4 (and their associated LEDs) are for composite video and audio input.*

- ⑤ **Configuration port** — This 2.5 mm port (jack) can be used to configure the PVS 204SA during setup via RS-232, and has the same RS-232 protocol as the rear panel RS-232/MLC/IR port. Use the optional 2.5 mm configuration cable, part # 70-335-01 (shown below), for connection to your PC’s serial port.

RS-232 protocol:

- 9600 baud • 1 stop bit • no parity • 8 data bits • no flow control



**Figure 3-2 — Front 2.5 mm port configuration cable**

**NOTE** *Extron recommends using this port to upload firmware, where necessary.*

- 
- ⑥ **Min/Max LED** — This red LED indicates when the range limits for the power amplifier level, Aux/Mix volume, or input gain level have been reached. See “Setting Up and Optimizing the Audio”, later in this chapter, for details. It lights as follows:
- When setting up input levels
  - When the PVS reaches the min./max. amplifier level
  - When the PVS reaches the min./max. Aux/Mix level
- ⑦ **Aux/Mix level encoder** — This recessed rotary encoder allows front panel adjustments specific to the Aux/Mix input level. The encoder has 16 positions per revolution, with each position equivalent to a 1 dB step (-18 dB to +24 dB range).
- ⑧ **Power amp level adjustment encoder (“Level”)** — This recessed rotary encoder allows front panel adjustment to all inputs (global) or, when used in conjunction with any selected input button, allows individual channel gain adjustment. The encoder has 16 positions per revolution, with each position equivalent to a 1 dB step (-10 dB to +10 dB range).
- ⑨ **Clip LED** — This red LED lights when the output amplifier is clipping.

**NOTE** *To reduce the risk of damaging equipment, turn the power amp level down (counterclockwise) when this LED is lit.*

## Setting Switcher Modes

The PVS 204SA has two selectable switcher modes: single switcher and separate switcher. The default setting is single switcher mode.

### Single switcher mode

This mode makes the PVS function as a 4x1 switcher. In single switcher mode, the RGB video output is inactive when composite video input is selected, and the composite video output is inactive when RGB video input is selected. Either RGB video OR composite video is output to the projector or display device, depending on which signal format is selected.

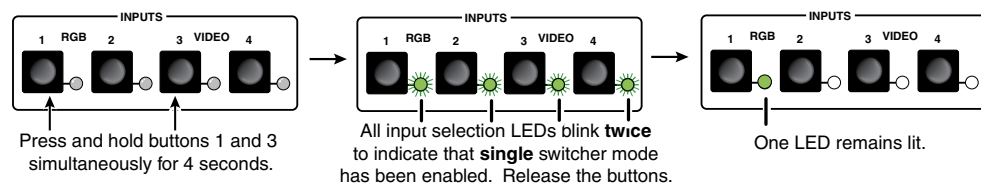
**NOTE** *The switcher should be set to single switcher mode if an MLC is connected.*

### Separate switcher mode

In this mode, both signal formats (RGB and composite video) are active at the same time, allowing RGB video AND composite video to be output to the projector or display device. The two modes can be toggled by front panel or RS-232. For details on RS-232 control, see chapter 4, “Serial Communication”.

### Setting the single switcher mode via the front panel

1. Press and hold input selection buttons 1 and 3 simultaneously for 4 seconds (see figure 3-3). All the input selection LEDs blink **twice**.
2. Release the buttons. The switcher has enabled single switcher mode and only one LED remains lit.

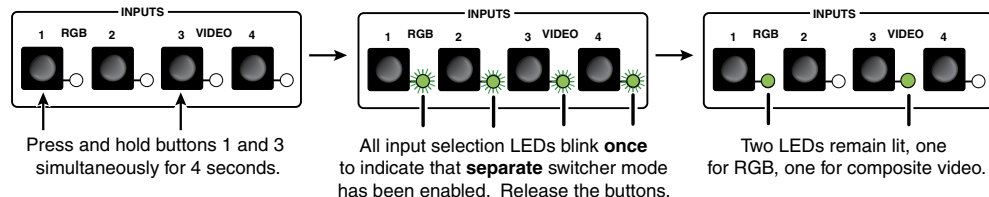


**Figure 3-3 — Setting single switcher mode via the front panel**

## Operation and Setup, cont'd

### Setting the separate switcher mode via the front panel

1. Press and hold input selection buttons 1 and 3 simultaneously for 4 seconds (see figure 3-4). All the input selection LEDs blink **once**.
2. Release the buttons. The switcher has enabled separate switcher mode and two LEDs remain lit (one for RGB format, one for composite video format).



**Figure 3-4 — Setting separate switcher mode via the front panel**

### Auto Switching

The PVS 204SA has an auto switching feature in single switcher mode only, that detects which input has an active sync signal and automatically switches to that signal.

In single switcher mode, the auto input switching follows the highest numbered active input, regardless of the signal format (RGB or composite video). For example, if input #2 (RGB) is currently active, and then #4 (composite video) becomes active, the input automatically switches to #4, regardless of format. In this example, the output signal changes from RGB to composite video.

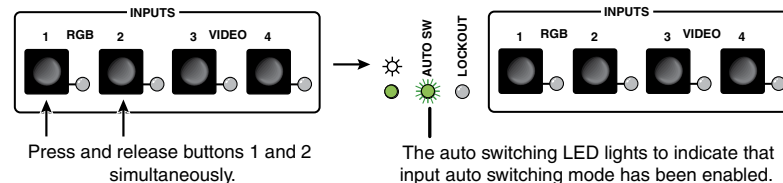
The PVS 204SA auto switching can be switched on or off from the front panel or via RS-232.

**NOTE** Auto switching is available only in single switcher mode. If separate switching mode is selected, auto switching is automatically disabled.

**NOTE** Whenever an input changes, the switcher sends an unsolicited response via RS-232 to the controller, alerting the controller of a possible need to change the projector input command.

### Setting the input auto switching mode via the front panel

1. Press and release input selection buttons 1 and 2 simultaneously (see figure 3-5). The input auto switching LED (labeled “Auto SW”) indicates the switching mode status (lit when enabled).



**Figure 3-5 — Setting input auto switching mode via the front panel**

---

## Setting Up and Optimizing the Audio

The following steps ensure optimal sound is achieved by configuring the PVS 204SA properly. For each step, refer to the sections indicated for more information.

### Steps for optimizing the audio

1. Ensure all the settings are at default. These are the settings the PVS has upon initial power up. The default settings are as shown below.
  - Volume is set at 50%.
  - Bass and treble are set at 0.
  - Power Amplifier level is set to 50% (default level is 0 dB).
  - Loudness control is set to Off.

**NOTE** *Amplifier level and volume level are **not** the same adjustments. Volume can **only** be adjusted by RS-232 or with a potentiometer connected to the rear panel port labeled “DC Vol”. Amplifier level is adjusted via the front panel encoder.*

2. Ensure that the PVT transmitters are connected to the PVS and that there is an audio input source present at each of the transmitters. Refer to the transmitters’ user’s manual for installation/connection information.
3. Ensure a set of speakers are connected to the PVS 204SA. See chapter 2, “Installation”, “Speaker Configuration” section, for details.
4. Slowly adjust the volume to 100% via RS-232, by having the MLC increase the volume, or by a potentiometer connected to the DC Volume port on the rear panel. If an MLC 104 IP Plus is connected to the PVS, simply rotate the volume knob clockwise until it is at full volume.
5. Adjust the input sensitivity for one input through the front panel or by RS-232 to a level just below where audio input is clipped. See the sections “Individual channel input sensitivity control” and “Clipping indicator”, later in this chapter, for details. Repeat for all four inputs.

**NOTE** *Adjusting input sensitivity for all inputs ensures that all inputs are at the same level, and at the highest level possible before clipping occurs. Step 5 ensures that when the volume is at 100%, the audio signal will not clip.*

6. When adjustments to all four inputs’ sensitivity settings have been made, adjust the amplifier level. Increase or decrease the amplifier level very slowly by turning the front panel level encoder counterclockwise until the desired level is reached.

**NOTE** *If the volume is at 100% through the MLC and the output on the speakers is too loud, reducing the amp level using the front panel encoder is recommended. This ensures that the volume will not be too loud, even when set at 100%.*

7. Fine tune the audio by making adjustments to the bass, treble, and loudness until the desired settings are reached. See “Bass, treble, and loudness control”, later in this chapter.

## Operation and Setup, cont'd

### Gain control

#### Individual channel input sensitivity control

Individual channel input gain control adjustments are made by rotating the encoder while pressing in the selected input button. The adjustment range is -18 dB to +24 dB, with the default set at 0 dB.

**NOTE** *Adjusting input sensitivity for all inputs ensures that all inputs are at the same level, and at the highest level possible before clipping occurs.*

**NOTE** *Individual channel input gain levels either adds to or subtracts from the overall (global) power amplifier gain level per channel.*

#### Front panel input sensitivity adjustment

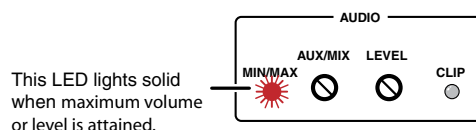
**NOTE** *Upon initial power up of the switcher, the amplifier level is automatically adjusted to 50% (0 dB).*

To make sure the right input sensitivity is attained, do the following:

1. Press and hold the selected input button for 3 seconds; the input's LED blinks.
2. While still pressing the input button, rotate the level encoder until the clip LED blinks (see "Clipping indicator" section, on the next page), then rotate it back down until the blinking ceases.

**NOTE** *Having the audio level beyond the point at which the clip LED flashes results in a distorted output signal (clipping).*

3. When the minimum (-18 dB) or the maximum (+24 dB) is reached, the Min/Max LED (see figure 3-6) lights red and flashes for approximately 0.3 seconds.



**Figure 3-6 — Front panel audio Min/Max LED and recessed encoders**

**NOTE** *If the setting is left at the extreme minimum or maximum, the LED stays on, then extinguishes after approximately a quarter of a second.*

Individual gain adjustment can also be made by RS-232 control as shown in chapter 4, "Serial Communication".

4. Repeat steps 1 through 3 for the other inputs as desired.

### Amplifier level control

Amplifier level control is adjusted via the recessed power amplifier level encoder (potentiometer) marked "Level" on the front panel. The encoder has 20 detents (steps) per revolution, each step making a 1 dB change. The adjustment range is -10 dB to +10 dB with the default set at 0 dB. To make adjustments, use a Tweezer or other small screwdriver to rotate the encoder as desired.

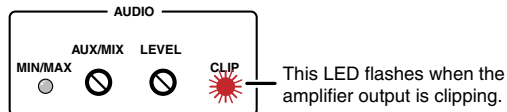
**NOTE** *When the minimum (-10 dB) or the maximum (+10 dB) is reached, the Min/Max LED (see figure 3-6) lights red and flashes twice, at approximately a 0.3 second interval. If the setting is left at the extreme minimum or maximum, the LED stays on, then extinguishes after approximately a quarter of a second.*



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## Clipping indicator

The clipping LED is a real time indicator of when the amplifier is clipping. It flashes red when clipping is taking place (see figure 3-7).



**Figure 3-7 — Front Panel audio clipping indicator LED and recessed encoders**

**NOTE** To reduce the risk of damage to the speaker, reduce the amplifier level by turning the encoder counterclockwise until the Clip LED turns off.

## Bass, treble, and loudness control

For optimum audio quality, the audio input levels and the bass, treble, and loudness controls must all be set up properly. Input audio levels may need to be adjusted depending on the variation of the output levels from different source devices.

**NOTE** By default these levels are set for the consumer product level of -10 dBV.

Bass and treble should be adjusted once the input and output levels have been adjusted. These are adjusted by RS-232 control only, with a range from -10 dB to +10 dB. By default the bass and treble have been set at 0 dB. See chapter 4, “Serial Communication”, for details on RS-232 control.

The loudness on/off (default off) switch and the clip limiter on/off (default off) function are also controlled by RS-232.

## Aux/Mix control

The Aux/Mix input is line level mono. It is divided into two matching channels and then summed with the main left and right channel audio inputs. Aux/Mix volume is independent of other input gains, power amp gain, and volume. The recessed encoder has 20 detents (steps) per revolution, each step making 1 dB change. The Aux/mix range is from -18 dB to +24 dB, default is 0 dB.

**NOTE** When the minimum (-18 dB) or the maximum (+24 dB) is reached, the min/max LED (see figure 3-6) flashes red.

## Resetting the Switcher

The switcher can be reset to the factory defaults via the front panel or RS-232.

To reset the switcher via the front panel, follow these steps.

1. Unplug the switcher from the power source.
2. Press and hold input selection button 1 while reapplying power to the switcher. All the input selection LEDs blink for 1 second while the switcher is reset.

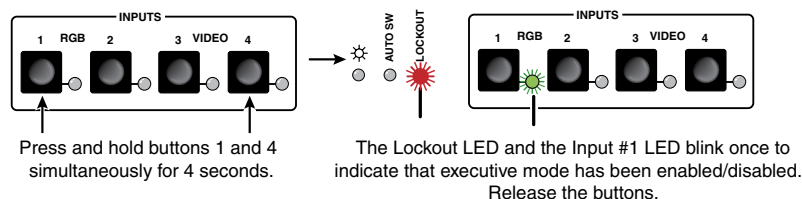
For details on RS-232 control, see chapter 4, “Serial Communication”.

### Front Panel Security Lockout (Executive Mode)

To prevent accidental or unauthorized changes to settings, the PVS switcher has a front panel security lockout (executive mode) that limits users' access to front panel controls. When the executive mode is active, all functions are locked, and a red lockout LED (next to the power LED) lights to indicate that executive mode is on. When a button is pressed (or an encoder turned) during lockout mode, the associated LED blinks three times at approximately 0.3 second intervals to indicate lockout.

To turn executive mode on or off via the front panel:

1. Press and hold input selection buttons 1 and 4 simultaneously for 4 seconds (see figure 3-8).
2. Release the buttons when the input selection #1 LED and the Lockout LED blink once. The switcher has enabled or disabled the executive mode.



**Figure 3-8 — Setting the executive mode via the front panel**

**NOTE** The lockout LED lights red when the executive mode is on.

This mode can also be turned on or off through RS-232 control. For details on RS-232 control, see chapter 4, "Serial Communication".



**PVS 204SA**

# 4

## **Chapter Four**

### **Serial Communication**

RS-232 Programmer's Guide

Updating Firmware

# Serial Communication

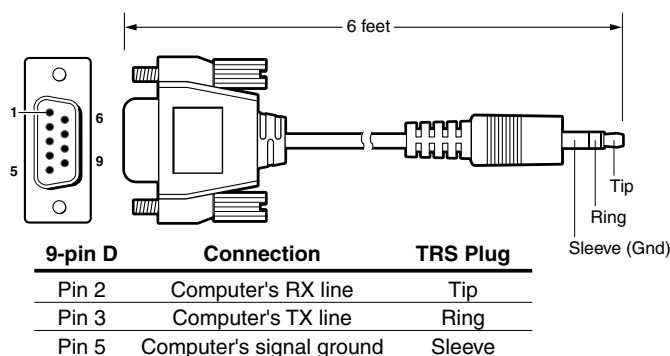
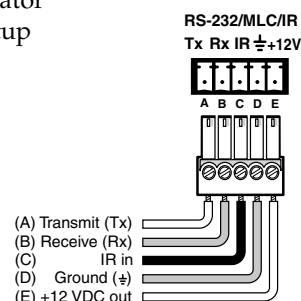
The PVS 204SA switcher can be remotely set up and controlled via a host computer or other device (such as a control system) attached to the rear panel RS-232/MLC/IR port. Alternatively, the switcher can be controlled by an optional MediaLink Controller (MLC) (connected to the same port) or by an RS-232 device acting through the MLC. The control device (host) can use either Extron's Simple Instruction Set (SIS™) commands or the Global Configurator (GC2) program for Windows. For details on use and setup of a system that includes a MediaLink Controller, refer to the MediaLink Controller user's manual.

## Switcher protocol:

- 9600 baud • 1 stop bit • no parity • no flow control

## RS-232/MLC/IR connector pin assignments:

**NOTE** Configuration can also be completed by connecting a 2.5 mm stereo mini cable (part # 70-335-01) to the 2.5 mm jack (port) on the front panel. This port has the same protocol as the RS-232 connector on the rear panel.



**Figure 4-1 — Pin out diagram for 2.5 mm mini cable TRS plug when connecting to the front panel Config port**

**NOTE** Firmware updates can be made only via the front panel Config port.

## RS-232 Programmer's Guide

### Host-to-PVS communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the PVS switcher determines that a command is valid, it executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF =  $\leftarrow$ ), which signals the end of the response character string. A string is one or more characters.

### PVS-initiated messages

When a local event such as a front panel selection or adjustment takes place, the PVS responds by sending a message to the host. No response is required from the host. The PVS-initiated messages are listed here (underlined).

© Copyright 2006, Extron Electronics, PVS 204SA, V1.xx Chn x

The PVS sends the copyright messages when it first powers on. V1.xx is the firmware version number.

Chn  $\boxed{x}$   $\leftarrow$  (where  $\boxed{x}$  is the input number)

The PVS sends this response when an input is switched.

## Error responses

When the PVS switcher receives a valid SIS command, it executes the command and sends a response to the host device. If the PVS is unable to execute the command because the command is invalid or it contains invalid parameters, it returns an error response to the host.

The error response codes and their descriptions are as follows:

- E01 – Invalid input channel number (too large)
- E06 – Invalid channel change
- E10 – Invalid command
- E13 – Invalid value (too large)
- E14 – Invalid command for this configuration

## Using the command/response tables

The command/response tables in this chapter list valid command ASCII codes, the PVS's responses to the host, and a description of the command's function or the results of executing the command. Upper and lower case characters may be used interchangeably in the command field unless otherwise specified (setting gain/attenuation, for example).

The ASCII to hexadecimal (HEX) conversion table below is for use with the command/response tables.

ASCII to HEX Conversion Table												Esc 1B	CR 0D	LF 0A																
20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27	(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
30	0	31	1	32	2	33	3	34	4	35	5	36	6	37	7	38	8	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
40	@	41	A	42	B	43	C	44	D	45	E	46	F	47	G	48	H	49	I	4A	J	4B	K	4C	L	4D	M	4E	N	4F
50	P	51	Q	52	R	53	S	54	T	55	U	56	V	57	W	58	X	59	Y	5A	[	5B	\	5C	]	5D	^	5E	_	5F
60	`	61	a	62	b	63	c	64	d	65	e	66	f	67	g	68	h	69	i	6A	j	6B	k	6C	l	6D	m	6E	n	6F
70	p	71	q	72	r	73	s	74	t	75	u	76	v	77	w	78	x	79	y	7A	{	7B		7C	}	7D	~	7E	DEL	7F

## ASCII to Hex conversion table

## Symbol definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = CR (carriage return)

**Esc** = Escape key

**X1** = Specific input number (0 through 4 and 7)  
0 = all output mute, both audio and video  
1 and 2 = RGB inputs (also 1 and 2 in RGB/VGA group)  
3 and 4 = composite video inputs in single switch mode (**In separate switcher mode composite video inputs are identified as 1 and 2**)  
7 = Aux/Mix input

**X2** = Pre-amp mode  
2 = Stereo  
1 = Dual Mono

**X3** = Status  
0 = Off  
1 = On

## Serial Communication, cont'd

---

**X4** = 0 – 14, bass and treble adjustment range  
(+/- 10.5 dB: 1.5 dB increments/decrements),  
default = 7 = 0 dB

Value	(dB)
0	-10.5
1	-9
2	-7.5
3	-6
4	-4.5
5	-3
6	-1.5
7	0
8	+1.5
9	+3
10	+4.5
11	+6
12	+7.5
13	+9
14	+10.5

**X5** = -10.5 to +10.5, bass and treble, readout in dB

**X6** = 0 – 100, volume, default = 50

**X7** = 0 – 24, input gain adjustment range, default = 0, in dB

**X8** = 1 – 42, input attenuation adjustment range, in dB

**X9** = -18 to + 24, input gain and attenuation readout, in dB

**X10** = -10 through +10, power amp gain readout, in dB

**X11** = Status  
1 = single mode  
2 = separate switcher mode

**X12** = 0 thru 20, power amp attenuation adjustment range,  
(where 0 = -10 dB, 20 = + 10 dB, in 1 dB increments/decrements)

**X13** = Status  
0 = not present/malfunction  
1 = present/OK

**X14** = Internal temperature

**X15** = Group  
1 = RGB/VGA  
2 = composite video/vid

**X21** = Version (X.XX)

**X22** = RGB delay in 0.5 second steps;  
0 = 0 seconds, 1 = 0.5 seconds, ...10 = 5.0 seconds

### Factory defaults

Input Audio Gain	<b>X7</b> = 0
Power Amp Gain	<b>X10</b> = 0
Volume	<b>X6</b> = 50
Bass Level	<b>X4</b> = 7
Treble Level	<b>X4</b> = 7
Switcher Mode	<b>X11</b> = 1
Audio Output	<b>X2</b> = 2
Clip Limiter	<b>X3</b> = 0
Loudness	<b>X3</b> = 0

## Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
<b>Input selection</b>			
Select an input (video and audio) <i>Example:</i>	$\boxed{x1}$ ! 2!	Chn $\boxed{x1}$ ← (single sw. mode) Chn2 ← (single sw. mode)	Select input $\boxed{x1}$ (video and audio). Select input 2.
Select an input (video and audio) <i>Example:</i>	$\boxed{x1}$ * $\boxed{x15}$ ! 1*2!	Chn $\boxed{x15}$ * $\boxed{x1}$ ! ← (sep. sw. mode) Chn1*2 ← (sep. sw. mode)	Select input $\boxed{x1}$ (composite video). Select input 1 of the composite video group.
Select an audio input	$\boxed{x1}$ \$	Aud $\boxed{x1}$ ←	Select input $\boxed{x1}$ audio only.
Select a video input (single sw. mode)	$\boxed{x1}$ &	Vid $\boxed{x1}$ ←	Select input $\boxed{x1}$ video only.
Select a video input (sep sw. mode)	$\boxed{x15}$ * $\boxed{x1}$ &	Vid $\boxed{x15}$ * $\boxed{x1}$ ←	Select input $\boxed{x1}$ video in group $\boxed{x15}$ only.
<b>Audio gain/attenuation (per input)</b>			
<b>NOTE</b> The set gain (G) and attenuation (g) are case sensitive.			
Set a specific input's gain. <i>Example:</i>	$\boxed{x1}$ * $\boxed{x7}$ G 2*9G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ← In2 Aud=+09 ←	Set a single input's gain (in dB). Set input 2's gain to +9 dB.
Set a specific input's attenuation <i>Example:</i>	$\boxed{x1}$ * $\boxed{x8}$ g 1*12g	In $\boxed{x1}$ Aud= $\boxed{x9}$ ← In1 Aud=-12 ←	Set an input's attenuation (in dB). Set attenuation to -12 dB.
<b>NOTE</b> Aux/Mix input is input 7.			
Increment a specific input's gain	$\boxed{x1}$ *+G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Increase an input's gain by 1 dB.
Decrement a specific input's gain	$\boxed{x1}$ *-G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Decrease an input's gain by 1 dB.
View a specific input's gain	$\boxed{x1}$ *G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Show an input's audio level.
Set the current input's gain	$\boxed{x7}$ G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Set the current input's gain (in dB).
Set the current input's attenuation	$\boxed{x8}$ g	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Set the current attenuation (in dB).
Increment the current input's gain	+G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Increase the gain by 1 dB.
Decrement the current input's gain	-G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Decrease the gain by 1 dB.
View the current input's audio gain	G	In $\boxed{x1}$ Aud= $\boxed{x9}$ ←	Show the audio level.
<b>Audio treble adjustment (applies to inputs 1-4)</b>			
<b>NOTE</b> Treble and bass are strictly global commands. They will only adjust twisted pair audio signals, not Aux/Mix signals.			
Set the treble level <i>Example:</i>	$\boxed{x4}$ > 2>	Trb= $\boxed{x5}$ ← Trb=-7.5 ←	Set the global treble level. Set treble to -7.5 dB.
Increment the treble level	+ >	Trb= $\boxed{x5}$ ←	Increase the treble by 1.5 dB.
Decrement the treble level	- >	Trb= $\boxed{x5}$ ←	Decrease the treble by 1.5 dB.
View the treble level	>	Trb= $\boxed{x5}$ ←	Show the current treble level.
<b>Audio bass adjustment (applies to inputs 1-4)</b>			
<b>NOTE</b> Treble and bass are strictly global commands. They will adjust only twisted pair audio signals, not Aux/Mix signals.			
Set the bass level <i>Example:</i>	$\boxed{x4}$ < 10<	Bas= $\boxed{x5}$ ← Bas=+4.5 ←	Set the global bass level. Set the bass to +4.5 dB.
Increment the bass level	+ <	Bas= $\boxed{x5}$ ←	Increase the bass by 1.5 dB.
Decrement the bass level	- <	Bas= $\boxed{x5}$ ←	Decrease the bass by 1.5 dB.
View the bass level	<	Bas= $\boxed{x5}$ ←	Show the current bass level.
<b>Audio mute</b>			
Mute on	1Z	Amt $\boxed{x3}$ ←	Mute audio output.
Mute off	0Z	Amt $\boxed{x3}$ ←	Unmute audio output.
View the audio mute status	Z	Amt $\boxed{x3}$ ←	Show the status of audio mute 0= off, 1 = on.

# Serial Communication, cont'd

## Command/response table for SIS commands (continued)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
<b>Volume adjustment</b>			
Set the overall output volume	[X6] V	Vol [X6] ⬅	Specify the volume (0-100) for the audio output.
Example:	27V	Vol027 ⬅	Set volume to 27.
Increment the volume	+V	Vol [X6] ⬅	Increase audio output.
Decrement the volume	-V	Vol [X6] ⬅	Decrease audio output.
View the volume level	V	Vol [X6] ⬅	Show the output volume.
<b>Status commands</b>			
These commands allow you to view the status of the clip indicator between adjustments to the audio input levels, the Volume Control Module status, the high pass filter status, and the internal temperature of the device.			
View the clip (max) status	3S	Sts3*[X3] ⬅	
View the VCM present status	40S	Sts40*[X13] ⬅	
View the high pass filter status	41S	Sts41*[X3] ⬅	
View the internal temperature (°C)	20S	Sts20*[X14] ⬅	
<b>Front panel security lockout modes (executive modes)</b>			
Disable executive mode (unlock)	0X	Exe [X3] ⬅	Adjustments and selections can be made from the front panel.
Enable executive mode 1 (lock)	1X	Exe [X3] ⬅	Lock front panel input selection buttons; select inputs via RS-232 or IR remote control only. Only volume adjustment is available via the front panel.
View the executive mode status	X	Exe [X3] ⬅	This command is equivalent to pressing and holding front panel buttons 1 and 4.
Example:	X	Exe0 ⬅	Show executive mode status. Executive mode is off (unlocked).
<b>Firmware version, part number &amp; information requests</b>			
Query firmware version number	Q	[X21] ⬅	Show the switcher's firmware version.
Request the part number	N	N60-800-01 ⬅	Show the switcher's part #.
Request model name	1I	PVS 204SA ⬅	
Request general info	I or 0I	(see below )	Show the switcher's status.
(single switcher mode)	<div>Vid [X1] • Aud [X1] • Vol [X6] ⬅ (Single sw mode)</div> <div>Video input # [X1] is selected/active      Audio input # [X1] is selected/active      Audio volume status      Switcher mode status</div>		
(separate switcher mode)	<div>Vga [X1] • Vid*[X1] • Aud*[X1] • Vol [X4] ⬅ (Sep sw mode)</div> <div>RGB input # [X1] is selected/active      Video input # [X1] is selected/active      Audio input # [X1] is selected/active      Audio volume status      Switcher mode status</div>		
<b>Upload firmware</b>			
Upload	[Esc] Upload ⬅	Go ⬅	The switcher will start uploading firmware code into its memory.
		Upl ⬅	The firmware was successfully loaded into the switcher.



## Command/response table for special function SIS commands

The syntax for setting a special function is `__ *  $\overline{x2}$  #`, where `__` is the function number and  `$\overline{x2}$`  is the value. To view a function's setting, use `__ #`, where `__` is the function number. In the following table the values of the  `$\overline{x2}$`  variable are different for each command/function. These values are given in the right-most column.

Command	ASCII Command (host to switcher)	Response (switcher to host)	$\overline{x2}$ values and additional descriptions
<b>Zap (reset to default settings)</b>			
Zap all PVS settings/memories	<code>[Esc] zXXX ↵</code>	<code>ZapXXX ↵</code>	Reset everything (all settings and adjustments) to the factory defaults.
<b>Delay times</b>			
Set the RGB delay	<code>3 * <math>\overline{x22}</math> #</code>	<code>RGBDly*<math>\overline{x22}</math> ↵</code>	0 = 0.0 seconds (default), 1 = 0.5 seconds, 2 = 1.0 seconds,..., in ½ second steps up to 10 = 5.0 seconds.
Example:	<code>3*7#</code>	<code>RGBDly*07↵</code>	Set a 3.5 second RGB delay.
View the RGB delay	<code>3#</code>	<code>RGBDly*<math>\overline{x22}</math> ↵</code>	
<b>Audio output mode</b>			
View the audio output mode status	<code>18#</code>	<code>PreAmpMod* <math>\overline{x2}</math> ↵</code>	View the audio outputs (1 = dual mono, 2 = stereo).
<b>NOTE</b> This command indicates whether the Audio Output Mode DIP switch on the rear panel of the PVS 204SA is set to Stereo mode or Dual Mono.			
<b>Loudness control</b>			
Set the loudness to off	<code>29 * 0 #</code>	<code>Loudness*0 ↵</code>	
Set the loudness to on	<code>29 * 1 #</code>	<code>Loudness*1 ↵</code>	
View the loudness control	<code>29 #</code>	<code>Loudness*<math>\overline{x3}</math> ↵</code>	0 = Off, 1 = On
<b>Switcher mode selection</b>			
<b>NOTE</b> Audio follows the last video/RGB selection in Separate Switcher mode.			
Set to single switcher mode	<code>1 * 1 #</code>	<code>SwMode*1 ↵</code>	
Set to separate switcher mode	<code>1 * 2 #</code>	<code>SwMode*2 ↵</code>	
View the switcher mode	<code>1 #</code>	<code>SwMode*<math>\overline{x11}</math> ↵</code>	1 = single, 2 = separate
<b>Auto Switching selection</b>			
Set auto switching to on	<code>72 * 1 #</code>	<code>Asw*1 ↵</code>	
Set auto switching to off	<code>72 * 0 #</code>	<code>Asw*0 ↵</code>	
View the auto switching setting	<code>72 #</code>	<code>Asw*<math>\overline{x3}</math> ↵</code>	0 = off, 1 = on
<b>Power Amp Gain/Attenuation</b>			
Set the attenuation (-dB)	<code>56 * <math>\overline{x12}</math> #</code>	<code>AmpLimit*<math>\overline{x10}</math> ↵</code>	$\overline{x12}$ = 0-20 power amp range
View the input gain	<code>56 #</code>	<code>AmpLimit*<math>\overline{x10}</math> ↵</code>	$\overline{x10}$ = -10 to +10 dB (in 1 db increments/decrements)
<b>Clip Limiter switch control</b>			
Set the Clip Limiter switch to off	<code>59 * 0 #</code>	<code>ClipLimit*0 ↵</code>	
Set the Clip Limiter switch to on	<code>59 * 1</code>	<code>ClipLimit*1 ↵</code>	
View the Clip Limiter control	<code>59 #</code>	<code>ClipLimit*<math>\overline{x3}</math> ↵</code>	0 = off, 1 = on

## Serial Communication, cont'd

### Updating Firmware

If the need arises, you can update the PVS's firmware without taking the unit out of service. Follow the directions below.

Check the Extron Web ([www.extron.com](http://www.extron.com)) site for firmware-related documents, instructions, patch files, and new firmware files before loading new firmware into the switcher. Extron recommends that you read the firmware release notes (available from the Web site [www.extron.com](http://www.extron.com)) before beginning the firmware update.

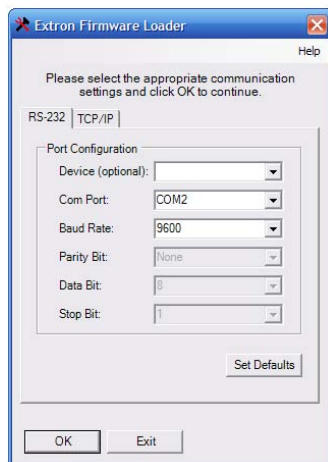
This procedure must be performed using a PC, with the PC's RS-232 port directly cabled to the PVS's front panel Config port.

**NOTE** *Each time you replace existing firmware, the switcher is reset to the factory default settings.*

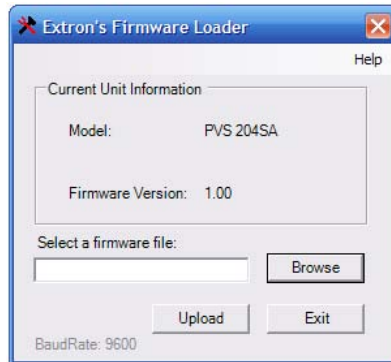
1. Visit the Extron Web site ([www.extron.com](http://www.extron.com)) and download the Firmware Loader file (FWLoader.exe) to your PC. Write down the filename and location for later use.
2. Locate (on the Web site) the appropriate firmware file (PVS 204SA) you want to update. It has a filename ending in .s19 (PVS204\_Vxxx.s19), where Vxxx indicates the version number (x.xx). Download the firmware from the Web site. The program automatically stores the firmware file on the PC in C:\Program Files\Extron Electronics\Firmware (a folder specific to that version). Write down the filename and location for later use.

**CAUTION** *The firmware update file must have a filename extension of .s19. If the file does not have that extension, it could cause the unit to stop functioning.*

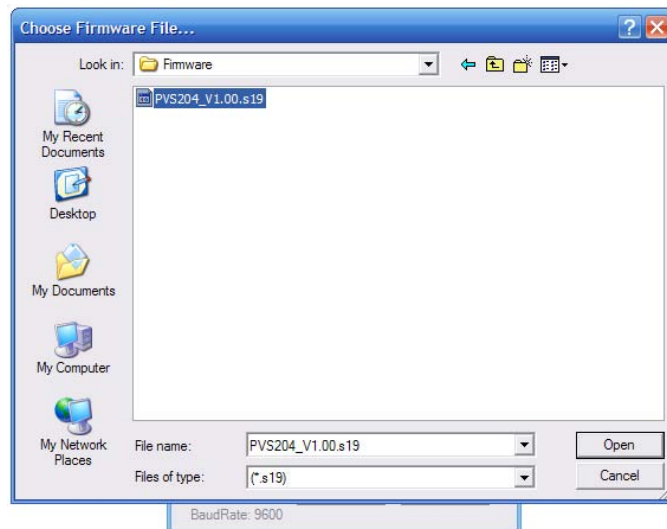
3. Connect a 2.5 mm configuration cable (Extron part # 70-335-01) between the front panel Config port of the PVS and the serial (RS-232) port of the PC, and power up the PVS and PC. See chapter 3, "Operation and Setup", "Front Panel Features and Operation" section, for details.
4. On the PC, select **Start > All Programs > Extron Electronics > Firmware Loader (folder) > Firmware Loader**, and start the program.
5. Select the Com port and Baud rate. Click **OK**. The PVS 204SA should be detected automatically.



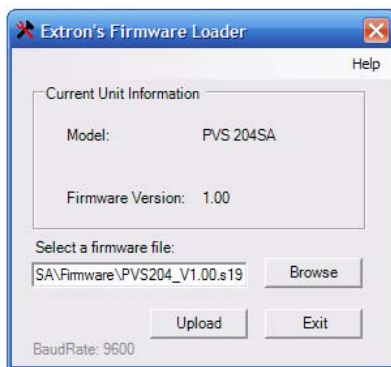
6. When the browser window opens, click **Browse** to locate and select the firmware file.



7. Select the firmware file and click **Open** to open the file.



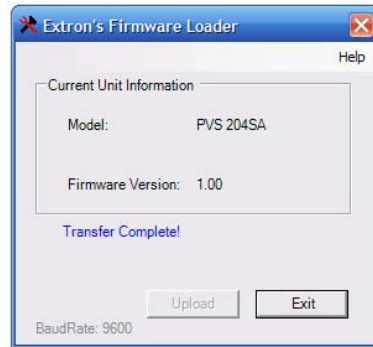
8. Click **Upload** to upload the firmware file into the PVS 204SA.



## Serial Communication, cont'd

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9. Wait until the status bar indicates completion. The note "Transfer Complete!" is shown and the unit resets itself.



10. Click **Exit** to exit the program upon completion.



# **Appendix A**

## **Reference Material**

Specifications

Part Numbers and Accessories

Audio Block Diagram

Audio Reference Levels

# Reference Material

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## Specifications

**NOTE** Where indicated by “<sup>†</sup>”, the relevant specification is given with the PVS operating as part of a system with proprietary Extron PVT transmitters for this product.

### Video — RGB

Gain .....	Unity <sup>†</sup>
Crosstalk .....	-70 dB @ 5 MHz
Switching speed .....	1 ms (max.) from front panel, 1-2 seconds from remote panel
CMRR .....	-90 dB @ 100 Hz, -70 dB @ 10 MHz

### Video input — RGB

Number/signal type.....	2 VGA-UXGA RGBHV, RGBS
Connectors .....	2 pairs female RJ-45 (See chapter 2, “Installation”, “A/V input connections” section, for pin configurations.)
Nominal level .....	0.7 V <sub>p-p</sub> for RGB <sup>†</sup>
Minimum/maximum levels.....	Analog: 0.3 V to 1.5 V <sub>p-p</sub> with no offset <sup>†</sup>
Impedance .....	75 ohms <sup>†</sup>
Horizontal frequency.....	15 kHz to 145 kHz
Vertical frequency.....	30 Hz to 170 Hz
DC offset (max. allowable).....	1.0 V

### Video output — RGB

Number/signal type.....	1 VGA-UXGA RGBHV, RGBS (follows input type)
Connectors .....	(1) 15-pin HD female
Nominal level .....	0.7 V <sub>p-p</sub> for RGB <sup>†</sup>
Minimum/maximum levels.....	0.3 V to 1.5 V <sub>p-p</sub> (follows input)
Impedance .....	75 ohms
Return loss .....	<-40 dB @ 5 MHz
DC offset .....	±5 mV, max., with input at 0 offset

### Video — composite video

Gain .....	Unity <sup>†</sup>
Differential phase error .....	0.25° at 3.58 MHz and 4.43 MHz
Differential gain error .....	0.15% at 3.58 MHz and 4.43 MHz
Switching speed .....	1 ms (max.) from front panel, 1-2 s from remote panel
CMRR .....	-90 dB @ 100 Hz, -70 dB @ 10 MHz

### Video input — composite video

Number/signal type.....	2 composite video
Connectors .....	2 female RJ-45 (See chapter 2, “Installation”, “A/V input connections” section, for pin configurations.)
Nominal level .....	1 V <sub>p-p</sub> for composite video (including sync) <sup>†</sup>
Minimum/maximum levels.....	Analog: 0.4 V to 2.0 V <sub>p-p</sub> with no offset
Impedance .....	75 ohms
Return loss .....	<-40 dB @ 5 MHz
DC offset (max. allowable).....	1.0 V

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## Video output — composite video

Number/signal type.....	1 composite video
Connectors .....	1 RCA female
Nominal level .....	1 Vp-p for composite video (including sync) <sup>†</sup>
Minimum/maximum levels.....	0.4 V to 2.0 Vp-p (follows input)
Impedance .....	75 ohms
Return loss .....	-40 dB @ 5 MHz
DC offset .....	±20.5 mV with input at 0 offset

## Sync

Input type .....	RGBHV, RGBS (RGB input)
Output type.....	RGBHV, RGBS (RGB output, follows input)
Standards.....	NTSC 3.58, NTSC 4.43, PAL, SECAM (for composite video inputs and outputs)
Input level .....	2.0 V to 5.5 Vp-p
Output level .....	4.5 V to 5.5 Vp-p, unterminated
Input impedance .....	511 ohms
Output impedance .....	75 ohms
Max. propagation delay .....	40 ns (system only, not due to cable delay)
Max. rise/fall time .....	15 ns
Polarity.....	Positive or negative (follows input)

## Audio input — refer to the PVT Series Transmitters' audio specifications

Number/signal type.....	4 proprietary signals from Extron PVT Series wall plates and transmitters
Connectors .....	4 female RJ-45 (2 shared with RGB inputs, 2 shared with composite video inputs)

**NOTE**     $0\text{ dBu} = 0.775\text{ Vrms}$ ,  $0\text{ dBV} = 1\text{ Vrms}$ ,  $0\text{ dBV} \approx 2\text{ dBu}$

## Audio — preamplifier

Input gain adjustment .....	-18 dB to +24 dB (default = 0 dB), adjustable per input via RS-232
Input level sensitivity .....	-10 dBV (0.316 Vrms) for maximum output before clipping
Volume control range .....	0 to -60 dB
Crosstalk .....	<-85 dB @ 1 kHz, (with 50' cables) <sup>†</sup>
Stereo channel separation .....	>80 dB @ 1 kHz, (with 50' cables) <sup>†</sup>
Bass adjustment.....	±10.5 dB @ 50 Hz
Treble adjustment.....	±10.5 dB @ 15 kHz

## Audio input —Aux/Mix

Number/signal type .....	1 mono, unbalanced or balanced
Connectors .....	(1) 3.5 mm captive screw connector, 3 pole
Impedance .....	>15k ohms unbalanced, DC coupled >22k ohms balanced, DC coupled
Nominal level .....	-20 dBV (100 mVrms)
Maximum level .....	+16 dBV (6.31 V), (balanced) at 1% THD+N

**NOTE**    *Input clips at +16 dBV. The clipping level changes when gain changes.*

Input gain/volume adjustment .	-18 dB to +24 dB (default = 0 dB), adjustable independently from all other audio gain and volume controls via front panel or RS 232
Input level sensitivity .....	-20 dBV (100 mV) for maximum output before clipping when Aux/Mix volume is set to 24

## Reference Material, cont'd

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### Audio output — power amplifier

Number/signal type .....	(1) stereo (default) or dual mono, 2 channels total
Connectors .....	(1) 5.0 mm captive screw connector, 4 pole
Impedance .....	4/8 ohms (single channel) or 4/8 ohms (stereo)
Amplifier type .....	Class D
Gain/volume adjustment .....	-10 dB to +10 dB (default = 0 dB), adjustable in 1 dB steps
Frequency response .....	20 Hz to 20 kHz, -1 dB/+3.5 dB @ 1 watt output, 8 ohm load
THD + Noise .....	0.2% @ 1 kHz at nominal level (1 watt, 8 ohm load)
S/N.....	>67 dB, 20 Hz to 20 kHz at maximum output (unweighted), 8 ohms (with 50' cables) †
Continuous power output with a full load at 1 kHz, 1% THD	
At 4 ohms.....	13 watts (rms) per channel (1 watt tolerance)
At 8 ohms.....	7 watts (rms) per channel (1 watt tolerance)
Damping factor.....	>80 (8 ohm load)

### Control/remote — switcher

Serial host control ports .....	2 bidirectional RS-232: 1 rear panel 3.5 mm captive screw connector, 5 pole (shared with IR control); 1 front panel 2.5 mm stereo mini jack
Baud rate and protocol.....	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations.	Captive screw connector: A = TX, B = RX, C = IR receive, D = GND, E = 12 VDC 2.5 mm mini stereo jack: tip = TX, ring = RX, sleeve = GND
DC volume control port .....	(1) 3.5 mm captive screw connector, 3 pole
DC volume control pin configurations	1 = 10 VDC, 2 = variable voltage or mute, 3 = GND
Volume control voltage range .....	0 V (mute) to 10 V (maximum volume)
Program control.....	Extron's Simple Instruction Set (SIS™)

### General

External power supply .....	100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 3 A, regulated
Power input requirements .....	12 VDC, 3 A
Temperature/humidity .....	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Rack mount .....	Yes, with optional 1U rack shelf, part #60-190-01 (RSU 129) or 60-604-01 (RSB 129); or 1U VersaTools® 3" deep rack shelf, part #60-190-20 (RSF 123) or 60-604-20 (RSB 123) Also furniture mountable with an optional MBU 123 mini under-desk mounting kit, part #70-212-01; or above-projector mountable with optional kits PMK 350 (#70-563-xx) or PMK 300 (#70-374-01)
Enclosure type .....	Metal
Enclosure dimensions .....	1.7" H x 8.7" W x 3.0" D (1U high, half rack wide) 4.3 cm H x 22.1 cm W x 7.6 cm D
Product weight .....	2.5 lbs (1.1 kg)
Shipping weight .....	5 lbs (2.3 kg)
Vibration .....	ISTA 1A in carton (International Safe Transit Association)
Listings.....	UL, CUL
Compliances.....	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF.....	30,000 hours
Warranty .....	3 years parts and labor

**NOTE** All nominal levels are at  $\pm 10\%$ .

**NOTE** Specifications are subject to change without notice.



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## Part Numbers and Accessories

These items are included in each order for an PVS 204SA switcher:

### Included parts

Included parts	Replacement part number
PVS 204SA switcher	60-800-01
Rubber feet (4)	
12 VDC, 3 A external power supply, (1)	
5-pole, 3.5 mm captive screw connector, (1)	10-703-12LF
3-pole, 3.5 mm captive screw connector, (1)	10-703-11LF
2-pole, 3.5 mm captive screw connector, orange (1)	10-762-10LF
2-pole, 5 mm captive screw connector, (1)	
PVS 204SA User's Manual	
Tweaker	

### Accessories

Accessory	Part number
<b>PVT Twisted Pair Transmitters</b>	
<b>Architectural Adapter Plate Models</b>	
PVT CV AAP, composite video transmitter	70-579-0x
PVT RGB AAP, RGB video transmitter	70-580-0x
<b>Decora Wall Plate Models</b>	
PVT CV D, composite video transmitter	70-579-0x
PVT RGB D, RGB video transmitter	70-580-0x
<b>Rack Mounted Transmitters</b>	
PVT CV, composite video transmitter	70-579-0x
PVT RGB CV, RGB and composite video transmitter	70-580-0x
<b>MediaLink Controllers</b>	
MLC 52 RS VC, IR and RS control, with volume control	60-745-12
MLC 52 RS, IR and RS control	60-744-12
MLC 104 IP Plus, with IP Link	60-818-xx
PMK 450, Pole Mount Kit	70-618-03
PCM 240, Projector ceiling mount	60-772-03
UPB 25, Universal projector mounting bracket	60-773-03
VCM 100 AAP, Volume and mute controller, AAP model	70-396-xx
VCM 100 MAAP, Volume and mute controller, mini AAP model	70-397-xx
VC 50, Volume controller wall plate	70-532-02
MSR 6, mini stereo plug to RCA audio adapter	26-592-01
MLP 101 D, mic to line preamplifier, Decora wall plate model	60-822-x2

## Reference Material, cont'd

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### Speaker accessories

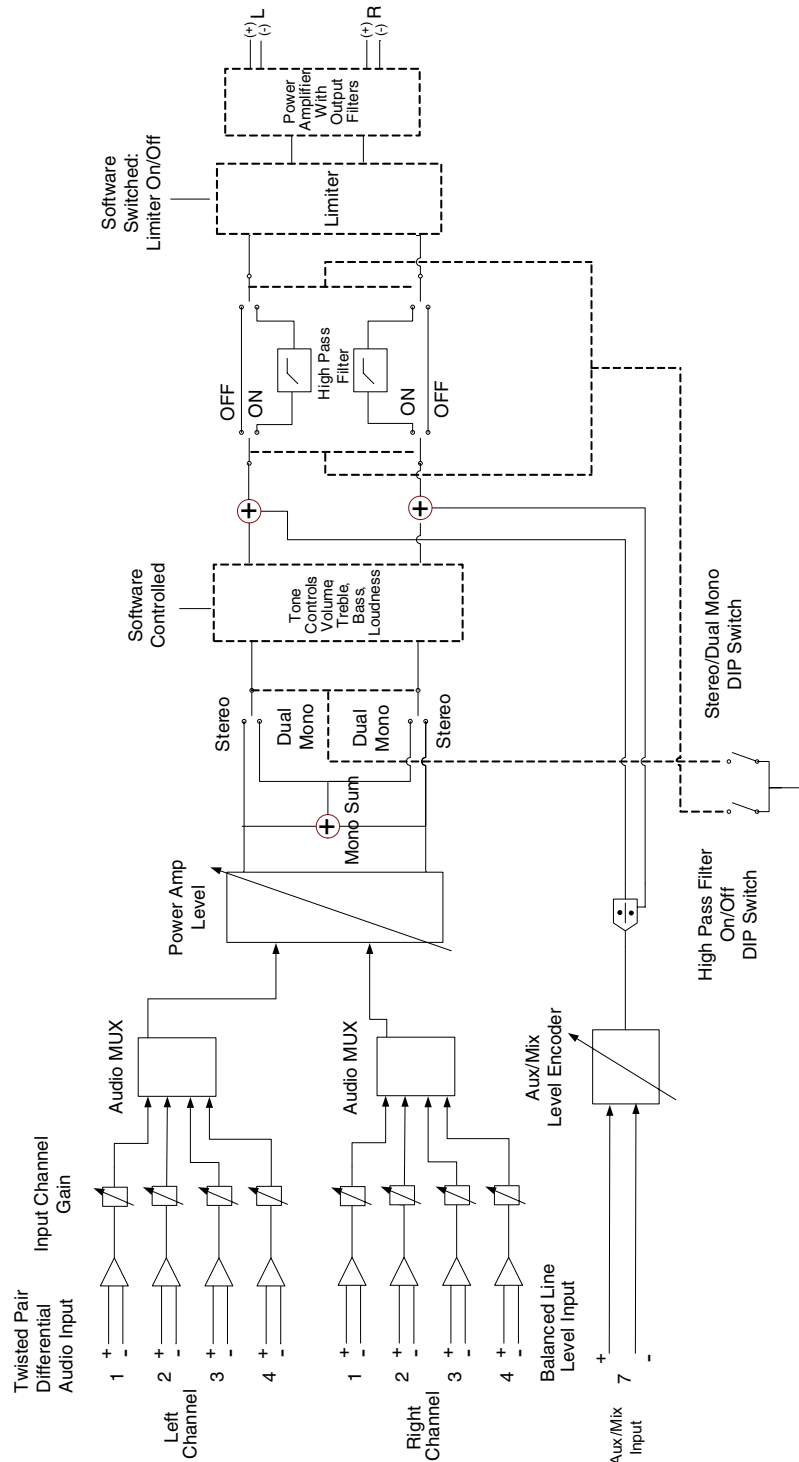
Accessory	Part number
SI 3C LP, Full-Range Ceiling Speakers, 4" Low Profile Back Can and Transformer	42-103-13
SI 26CT, Two-Way Ceiling Speakers, 8" Back Can and Transformer	42-070-03
SI 26, Two-Way Surface Mount Speakers, 6.5" Woofer	42-072-0x
SI 26W, Two-Way In-Wall Speakers, 6.5" Woofer	42-068-03
SI 26X, Two-Way Open Back Ceiling Speakers	42-067-03
SI 28, Two-Way Surface Mount Speakers, 8" Woofer	42-073-0x
SI 28W, Two-Way In-Wall Speakers, 8" Woofer	42-069-03

### Cable accessories

Accessory	Part number
CFG cable, 9-pin D female to 2.5 mm TRS configuration cable	70-335-01
MLC IR/RS-232 cable, projector cable, plenum	26-621-xx
MLC PW/RS-232/VC cable, power, switcher, and volume control, plenum	26-626-xx
MVGA M-M/3 cable, 3' male to male micro VGA cable	26-567-01
MVGA M-M/6 cable, 6' male to male micro VGA cable	26-567-02
V RCA/3 cable, 3' RCA male to male composite video cable	26-600-03
V RCA/6 cable, 6' RCA male to male composite video cable	26-600-01
CAT 5 cable, 35', plenum	26-637-35
CAT 5 cable, 50', plenum	26-637-50
CAT 5 cable, 75', plenum	26-637-75
CAT 5 cable, 100', plenum	26-637-100

## Audio Block Diagram

The diagram below represents audio signal flow within the PVS 204SA.



**Figure A-1 — PVS 204SA audio block diagram**

## Reference Material, cont'd

### Audio Reference Levels

The specifications for the audio source devices may be listed in one of several units. You may wish to use a sine wave generator such as the Extron VTG 300 as a source for setting up audio inputs before the input devices are available. The tables below are a convenient reference for equivalences between dBV, voltage, and dBu.

dBV	Voltage	dBu
-20 dBV	0.100 V	-17.8 dBu
-19 dBV	0.112 V	-16.8 dBu
-18 dBV	0.126 V	-15.8 dBu
-17 dBV	0.141 V	-14.8 dBu
-16 dBV	0.158 V	-13.8 dBu
-15 dBV	0.178 V	-12.8 dBu
-14 dBV	0.200 V	-11.8 dBu
-13 dBV	0.224 V	-10.8 dBu
-12 dBV	0.251 V	-9.8 dBu
-11 dBV	0.282 V	-8.8 dBu
<b>-10 dBV</b>	<b>0.316 V</b>	<b>-7.8 dBu</b>
-9 dBV	0.355 V	-6.8 dBu
-8 dBV	0.397 V	-5.8 dBu
-7 dBV	0.447 V	-4.8 dBu
-6 dBV	0.501 V	-3.8 dBu
-5 dBV	0.562 V	-2.8 dBu
-4 dBV	0.631 V	-1.8 dBu
-3 dBV	0.708 V	-0.8 dBu
-2 dBV	0.794 V	0.2 dBu
-1 dBV	0.891 V	1.2 dBu
0 dBV	1.000 V	2.2 dBu
1 dBV	1.122 V	3.2 dBu
2 dBV	1.259 V	4.2 dBu
3 dBV	1.413 V	5.2 dBu
4 dBV	1.585 V	6.2 dBu
5 dBV	1.778 V	7.2 dBu
6 dBV	1.995 V	8.2 dBu
7 dBV	2.24 V	9.2 dBu
8 dBV	2.51 V	10.2 dBu
9 dBV	2.82 V	11.2 dBu
10 dBV	3.16 V	12.2 dBu

dBu	Voltage	dBV
-20 dBu	0.078 V	-22.2 dBV
-19 dBu	0.087 V	-21.2 dBV
-18 dBu	0.098 V	-20.2 dBV
-17 dBu	0.109 V	-19.2 dBV
-16 dBu	0.123 V	-18.2 dBV
-15 dBu	0.138 V	-17.2 dBV
-14 dBu	0.155 V	-16.2 dBV
-13 dBu	0.174 V	-15.2 dBV
-12 dBu	0.195 V	-14.2 dBV
-11 dBu	0.218 V	-13.2 dBV
-10 dBu	0.245 V	-12.2 dBV
-9 dBu	0.275 V	-11.2 dBV
-8 dBu	0.309 V	-10.2 dBV
-7 dBu	0.346 V	-9.2 dBV
-6 dBu	0.388 V	-8.2 dBV
-5 dBu	0.436 V	-7.2 dBV
-4 dBu	0.489 V	-6.2 dBV
-3 dBu	0.549 V	-5.2 dBV
-2 dBu	0.616 V	-4.2 dBV
-1 dBu	0.691 V	-3.2 dBV
<b>0 dBu</b>	<b>0.775 V</b>	<b>-2.2 dBV</b>
1 dBu	0.870 V	-1.2 dBV
2 dBu	0.976 V	-0.2 dBV
3 dBu	1.095 V	0.8 dBV
<b>4 dBu</b>	<b>1.228 V</b>	<b>1.8 dBV</b>
5 dBu	1.378 V	2.8 dBV
6 dBu	1.546 V	3.8 dBV
7 dBu	1.735 V	4.8 dBV
8 dBu	1.974 V	5.8 dBV
9 dBu	2.184 V	6.8 dBV
10 dBu	2.451 V	7.8 dBV

**Figure A-2 — Audio reference tables**

# Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America,  
and Central America:**

Extron Electronics  
1001 East Ball Road  
Anaheim, CA 92805, USA

**Asia:**

Extron Electronics, Asia  
135 Joo Seng Road, #04-01  
PM Industrial Bldg.  
Singapore 368363

**Europe, Africa, and the Middle East:**

Extron Electronics, Europe  
Beeldschermweg 6C  
3821 AH Amersfoort  
The Netherlands

**Japan:**

Extron Electronics, Japan  
Kyodo Bldg.,  
16 Ichibancho  
Chiyoda-ku, Tokyo 102-0082  
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

*If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.*

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

<b>Extron USA - West</b> Headquarters <b>+800.633.9876</b> Inside USA / Canada Only <b>+1.714.491.1500</b> <b>+1.714.491.1517</b> FAX	<b>Extron USA - East</b> <b>+800.633.9876</b> Inside USA / Canada Only <b>+1.919.863.1794</b> <b>+1.919.863.1797</b> FAX	<b>Extron EMEA</b> <b>+800.3987.6673</b> Inside Europe Only <b>+31.33.453.4040</b> <b>+31.33.453.4050</b> FAX	<b>Extron Asia</b> <b>+800.7339.8766</b> Inside Asia Only <b>+65.6383.4400</b> <b>+65.6383.4664</b> FAX	<b>Extron Japan</b> <b>+81.3.3511.7655</b> <b>+81.3.3511.7656</b> FAX	<b>Extron China</b> <b>+400.883.1568</b> Inside China Only <b>+86.21.3760.1568</b> <b>+86.21.3760.1566</b> FAX	<b>Extron Middle East</b> <b>+971.4.2991800</b> <b>+971.4.2991880</b> FAX
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